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United States  
Department of  
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Agricultural  
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Beltsville, Agricultural  
Research Center  
Beltsville, Maryland

February 1989

# National Potato Germplasm Evaluation and Enhancement Report, 1987

Fifty-Eighth Annual Report  
by Cooperators





UNITED STATES  
DEPARTMENT OF  
AGRICULTURE

NATIONAL POTATO GERMPLASM EVALUATION  
AND ENHANCEMENT REPORT, 1987

Agricultural  
Research  
Service

Fifty-eighth Annual Report by Cooperators

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Beltsville Agricultural  
Research Center

Beltsville, Maryland

February 1989



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UNITED STATES DEPARTMENT OF AGRICULTURE  
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC), BELTSVILLE,  
MARYLAND, AND CHAPMAN, ECHO LAKE, AND AROOSTOOK FARMS,  
PRESQUE ISLE, MAINE

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D. R. Wilson, Presque Isle, Maine

BARC

BREEDING: Emphasis in parental combinations centered around assembling the maximum number of genes for pest resistance, high quality and wide adaptability into seed progenies segregating for differing skin types (white, red, russet), flesh color (white, yellow), tuber shape (round, long), and maturity (early, medium, late) in the various eastern United States ecological test zones (south, mid-Atlantic, northeast). A high leptine diploid clone tolerant to the potato beetle developed by Dr. S. Sinden was included in the crossing program. Four hundred eleven crosses were successful among 109 virus-viroid tested parental clones and varieties. The growing season was above normal in intermittent cloud cover which resulted in reduced seed set. Approximately 200,000 true seed were produced. About 30,000 seedling tubers were produced from 137 parental combinations. Approximately 22,000 "A" seedling tubers were sent for planting on Chapman and 6,000 "B" seedling tubers on Aroostook Farm (late blight test), Presque Isle, Maine. Surplus seedling tubers were shared with several cooperating states.

EVALUATION: Selections from progenies segregating for resistance to potato viruses A (PVA), X (PVX), and Y (PVY) were screened by mechanical and graft means at BARC. Sixty nine percent of selections tested resistant to PVA, 54% were resistant to PVX, and 39% were resistant to PVY. Screening selected parental types for resistance to potato virus M (PVM) was initiated.

Clonal/Varietal Distribution: Seed tubers of promising clones and standard varieties were distributed for adaptability and processing trials to New Jersey, Virginia, North Carolina, and Georgia. Clonal and true seed stocks were sent for research purposes to several states and two foreign countries.

Presque Isle, Maine

CHAPMAN FARM: Approximately 22,000 seedling tubers from 137 parental combinations were planted on Chapman. Sixteen hundred selections were made for planting in 12-hill plots for selection and initial quality evaluations in 1988. One hundred seventy selections were retained from the 8-hill group. All additional materials planted on Chapman were done again in tuber units with 6 feet between rows and 5 feet between units to continue the virus-viroid indexing program.

<sup>1</sup>retired 1/2/88

<sup>2</sup>joined program 10/11/87

Duplicate seed increase plantings of Chapman stocks indexed in 1986 were planted at regular row and hill spacing intervals on Chapman and Echo Lake for further evaluation and seed distribution to cooperators.

ECHO LAKE: Round white and russet yield trials (Tables 1, 2, 3, 4, 5, 6, 7, and 8) and cooperator clonal increases were the major plantings on Echo Lake Farm in 1987. Weather conditions prevailing on Aroostook Farm and Echo Lake (one mile south) were uniformly dry and warm during most of the 1987 growing season. Only about 10 inches of rainfall occurred during the growing season until just before vine kill time in September. Late season moisture materially improved yields but apparently did not significantly lower specific gravity nor negatively impact on processing quality during tuber storage. Richard Moore, Maine Department of Agriculture, noted very little disease during visual inspections of the program's various plantings in Maine as well as in the clonal stocks grown in the Florida winter test plantings. No new materials were submitted to Sangerville for inclusion in NE107 evaluations pending reduction in the number of the 15 plus clones sent in 1986 and earlier.

AROOSTOOK FARM: Maintenance of about 150 domestic and 15 foreign varieties and germplasm with specific characteristics used in breeding continued. These are grown in widely spaced tuber unit plantings and tested for virus infection.

Late Blight: Nineteen clones highly resistant in previous years' evaluations were included in the test plot in 1987. Approximately 6,000 seeding tubers from 24 diverse parental combinations, one parent of which had tested highly resistant in at least two previous trials, were planted for selection to broaden the germplasm base of resistance to late blight. Isolates of the pathogen collected from the 1986 test plot were used to blanket inoculate the plot including the susceptible check rows in the evening hours during the first week in July. Final disease assessments and selection among single hill entries were made September 23. Previously tested clones continued to largely resist infection. One hundred twenty six individual plant selections were made among the blight resistant single hill progeny based on apparent horticultural characteristics. These clones were gassed with dormancy breaking ethylene chlorohydrin and sent to BARC for foundation seed increase in the greenhouse and retest for blight resistance in 1988.

Verticillium Wilt-Pinkeye: One hundred forty three new selections and 28 clones previously testing resistant/tolerant were included in the 1987 test trial. Final disease assessments were done October 2. Forty six new entries and 26 retested clones were as highly tolerant/resistant to plant infection/symptom development as check varieties Russette and Abnaki. Thirty five new clones and only 19 of the retested clones did not show symptoms of pinkeye infection.



Scab: One hundred twenty three new entries and 31 previously tested clones were included in the trial for 1987. Fifty seven new entries and 18 of the retested clones were as tolerant/resistant to scab as the check varieties Superior, Ontario, and Russet Burbank.

Processing: Samples stored at 40°F and 50°F were processed into chips and french fries after 4-4-1/2 months' storage. Out-of-grade items in the 40°F storage samples were reconditioned at 70°F for 3 weeks before processing.

Potato chips were made from each sample by taking 1/16-inch slices from cross- and lengthwise sections of each tuber. Lengthwise chips were used to detect possible increase in reducing sugars, particularly near the stem end. Slices were rinsed in water and placed on paper towels to remove excess moisture. Chips were then fried at 340°F in Primex vegetable shortening until bubbling ceased.

Long tuber types were processed only into french fries. A 3/8-inch diameter plug was cut from the cross- and lengthwise sections of each tuber, washed, dried, and fried at 360°F for 5 minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French fry classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or fries in each color class by the color class, totaled, and divided by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

Processing results from storage/temperature evaluation periods are given in Tables 1, 2, 3, 4, 5, 6, 7, and 8. Storage period began October 28. Processing capabilities of a number of promising clones were improved over that of the 1986 trials in part due to the relatively low rainfall period during tuber enlargement in August and September prior to vine kill.

## Summary

Progress toward broadening the multidisease-resistant germplasm base with increased numbers of promising clones with intense red skin and yellow flesh was evident among the approximately 1,600 first year selections made from segregating populations. More desirable leaf type, vine stature, maturities, and tuber and skin types among russet progenies was apparent among the 1987 seedling tuber planting.

Commercial assessment of both round, white clones (primarily for processing from low temperature storage and adaptation) and russet types (for productivity, adaptability, and french fry quality) continued. Among the most promising clones included B9792-2B, B9792-8B, B9792-61, B9792-157, B9792-158, B0172-15, B0174-16, B0178-34 (round whites), B9596-2, B9922-11, B0045-6, and B0220-14. B9596-2 was released as the variety Coastal Russet cooperatively with New York, Florida, Virginia, New Jersey, and Maine.

BARC Table 1. Yield, tuber size distribution, and quality characteristics of round whites harvested 119 days after planting at Echo Lake in 1987.

Pedigree	Mkt CWT/A	% Mkt	Tuber size distribution						Tuber <sup>1</sup> Rating	Spec <sup>2</sup> Grav	Chip Color <sup>3</sup>			
			<1-7/8"	1-7/8"- 2-1/4"	2-1/4"- 3-1/4"	3-1/4"- 4"	4.5	>4"			50°F <sup>4</sup>	40°F <sup>5</sup>	40°F <sup>6</sup>	70°F <sup>6</sup>
B9792-2B	231	84	15.5	49.6	30.3	4.5	0.0	0.0	4	109	6.75	7.60	7.80	
B9792-8B	285	86	13.5	47.5	38.1	0.9	0.0	0.0	4	100	6.40	6.65	6.75	
B9792-157	296	88	10.8	42.4	39.8	5.6	1.4	0.0	5	099	6.20	7.15	7.20	
B9792-158	303	86	13.6	49.8	34.5	2.2	0.0	0.0	6	098	7.40	7.20	7.55	
B9933-25	252	88	12.3	54.4	32.1	1.1	0.0	0.0	7	088	6.10	6.55	6.50	
B9935-10	273	93	7.4	36.9	54.1	1.6	0.0	0.0	5	097	6.45	6.55	7.15	
B9955-10	232	81	18.5	58.3	23.1	0.0	0.0	0.0	5	106	6.60	7.65	7.70	
B9955-33	310	94	5.4	32.4	52.4	9.2	0.6	0.0	4	104	6.55	6.80	7.55	
B9955-46	250	94	4.2	22.3	62.6	9.1	1.7	0.0	4	094	6.60	7.20	8.10	
Superior	210	93	6.7	33.1	54.1	6.1	0.0	0.0	5	094	6.65	7.95	7.05	
B9988-7	322	93	7.5	42.0	48.3	2.2	0.0	0.0	5	100	6.50	7.55	7.55	
B9988-14	350	96	4.3	33.5	61.5	0.7	0.0	0.0	5	095	6.35	7.40	7.20	
B9988-23	304	94	6.4	35.7	56.4	1.4	0.0	0.0	6	097	6.80	7.35	6.95	
B9988-24	285	92	8.2	53.5	38.3	0.0	0.0	0.0	5	094	6.90	7.20	6.75	
B0034-10	238	87	12.6	53.8	32.1	1.4	0.0	0.0	5	106	6.45	7.60	7.45	
Monona	271	93	5.5	29.9	55.5	8.0	1.1	0.0	5	083	6.05	7.30	6.95	
Sunrise	277	89	10.8	33.7	48.1	6.7	0.7	0.0	5	087	7.05	8.45	8.00	
Atlantic	312	88	11.1	38.7	46.5	3.2	0.5	0.0	6	113	6.45	7.05	6.85	
LSD 5%	55													

<sup>1</sup>1 = poor; 9 = outstanding

<sup>2</sup>1.0 omitted

<sup>3</sup>Chips: 1-7 satisfactory

<sup>4</sup>Chipped on 1/7/88

<sup>5</sup>Chipped on 2/3/88

<sup>6</sup>Chipped on 3/7/88

<sup>1,2,3</sup>See footnotes Table 2.

<sup>4</sup>Chipped on 1/8/88

<sup>5</sup>Chipped on 1/6/88

<sup>6</sup>Chipped on 2/2/88

BARC Table 3. Yield, tuber size distribution, and quality characteristics of round whites harvested 119 days after planting at Echo Lake in 1987.

Pedigree	Mkt CWT/A	% Mkt	Tuber size distribution						Tuber <sup>1</sup> Rating	Spec <sup>2</sup> Grav	Chip Color <sup>3</sup>		
			<1-7/8"	1-7/8-2-1/4"	2-1/4-3-1/4"	3-1/4-4"	4"	>4"			50°F <sup>4</sup>	40°F <sup>5</sup>	40°-70°F <sup>6</sup>
B0179-18	320	94	2.4	13.9	62.0	18.4	3.3	5	103	6.40	7.10	6.75	
B0180-36	324	90	9.8	43.0	43.9	2.7	0.6	5	103	6.40	6.95	6.95	
B0183-25	320	91	9.0	42.7	43.2	5.1	0.0	3	096	6.45	8.25	7.60	
B0200-36	210	79	20.9	52.2	26.5	0.5	0.0	4	100	6.50	7.15	6.70	
B0202-4	284	90	9.2	42.8	45.9	1.4	0.7	4	102	6.05	7.10	6.75	
B0203-21	305	92	7.0	33.0	51.6	7.8	0.7	5	091	6.45	7.40	6.15	
B0207-9	238	83	17.1	46.4	34.7	1.8	0.0	5	100	6.40	7.25	7.15	
B0209-1	355	97	3.0	22.4	59.2	15.3	0.0	5	095	6.70	6.80	7.10	
B0214-9	284	94	5.1	32.3	54.0	7.4	1.1	4	086	6.35	7.45	6.80	
B0233-1	358	95	2.7	18.4	57.4	19.3	2.1	6	087	6.40	6.60	6.30	
B0234-4	310	94	5.6	31.8	55.1	6.9	0.8	5	097	5.80	6.90	6.60	
B0237-9	284	92	7.6	34.3	53.8	4.3	0.0	5	092	6.15	7.30	6.60	
B0238-4	294	90	9.9	43.8	41.1	5.2	0.0	4	102	6.25	7.10	6.80	
B0238-16	220	74	25.7	51.8	22.5	0.0	0.0	5	097	6.25	6.90	6.85	
B0238-21	253	88	11.7	42.2	42.2	3.9	0.0	4	085	6.35	6.70	6.90	
Atlantic	309	91	8.5	38.0	45.5	7.1	0.7	5	106	6.60	7.15	6.80	
Superior	287	94	5.7	36.8	49.8	7.7	0.0	5	095	6.35	7.25	6.45	
Kennebec	323	95	4.4	21.6	59.6	13.5	0.8	5	091	6.45	7.10	6.25	
LSD 5%	42												

<sup>1,2,3</sup> See footnotes Table 2.

<sup>4</sup> Chipped on 1/8/88

<sup>5</sup> Chipped on 2/2/88

<sup>6</sup> Chipped on 3/7/88

BARC Table 4. Yield, tuber size distribution, and quality characteristics of round whites harvested 119 days after planting at Echo Lake in 1987.

Pedigree	Mkt CWT/A	%	Tuber size distribution					Tuber <sup>1</sup> Rating	Spec <sup>2</sup> Grav	Chip Color <sup>3</sup>		
			<1-7/8"	1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	>4"			50° F <sup>4</sup>	40° F <sup>5</sup>	40° -70° F <sup>6</sup>
B0238-31	280	91	7.8	32.8	51.2	7.5	0.7	4	094	6.15	6.50	6.40
B0239-29	262	78	21.9	47.8	27.3	3.1	0.0	5	093	6.00	6.45	6.60
B0241-8	333	88	7.3	23.6	50.9	13.9	4.3	5	094	6.25	6.55	6.85
B0242-31	277	88	12.2	39.0	45.1	3.8	0.0	5	079	6.15	6.55	6.55
B0243-7	296	93	7.0	36.7	51.8	4.5	0.0	4	090	6.10	6.75	7.00
B0243-10	298	92	7.4	34.7	49.6	7.6	0.8	5	095	6.05	7.00	7.10
B0243-20	283	94	6.3	35.9	52.7	5.1	0.0	5	091	5.75	7.35	7.55
B0244-6	247	80	19.8	47.4	31.1	1.7	0.0	3	097	6.45	6.70	7.05
B0245-8	304	89	9.0	33.4	48.8	6.6	2.1	6	100	6.35	6.25	6.65
B0246-4	329	94	6.0	36.9	52.0	5.1	0.0	5	094	6.25	7.10	6.45
B0246-6	335	95	5.2	27.5	58.9	8.4	0.0	5	087	6.30	7.10	6.85
B0246-7	286	88	11.9	46.5	40.3	1.3	0.0	4	099	5.75	6.85	7.15
B0246-8	290	87	12.8	52.4	32.6	2.2	0.0	6	096	6.70	7.20	6.75
B0251-5	283	90	10.3	42.8	41.9	5.1	0.0	5	106	6.75	7.00	7.10
B0255-5	308	87	13.1	54.8	30.7	1.4	0.0	6	088	6.30	7.15	6.95
B0255-9	260	87	12.8	42.0	40.5	4.8	0.0	5	100	6.00	6.85	6.80
Atlantic	308	89	10.7	41.2	43.8	4.3	0.0	6	106	6.00	6.75	6.70
Kennebec	301	93	5.9	25.1	51.0	17.1	0.9	6	080	5.80	6.60	6.65
ISD 5%	35											

<sup>123</sup>See footnotes Table 2

<sup>4</sup>Chipped on 1/11/88

<sup>5</sup>Chipped on 2/1/88

<sup>6</sup>Chipped on 3/8/88



BARC Table 5. Yield, tuber size distribution, and quality characteristics of round whites harvested 119 days after planting at Echo Lake in 1987.

Pedigree	Mkt CWT/A	%	Tuber size distribution					Tuber <sup>1</sup> Rating	Spec <sup>2</sup> Grav	Chip Color <sup>3</sup>			
			<1-7/8"	1-7/8"- 2-1/4"	2-1/4"- 3-1/4"	3-1/4"- 4"	>4"			50° F <sup>4</sup>	40° F <sup>5</sup>	40° F <sup>5</sup>	70° F <sup>6</sup>
B0256-1	271	94	4.1	23.4	61.8	8.5	2.2	6	112	6.60	7.75	7.75	7.25
B0256-15	186	87	13.4	42.3	42.5	1.8	0.0	6	094	6.10	7.05	7.05	7.00
B0257-3	203	86	14.4	52.9	32.2	0.6	0.0	5	111	6.40	6.90	6.90	6.85
B0257-8	182	88	12.5	47.3	39.0	1.2	0.0	5	109	6.10	7.15	7.15	7.25
B0257-9	238	95	4.6	25.3	65.7	4.5	0.0	5	101	5.90	6.70	6.70	7.00
B0257-12	228	89	11.2	39.1	48.8	0.9	0.0	6	106	6.15	6.95	6.95	6.85
B0172-12	227	90	9.8	34.0	54.1	2.2	0.0	5	098	6.30	6.80	6.80	6.95
B0174-11	236	95	5.3	26.6	65.3	2.8	0.0	6	106	6.20	6.90	6.90	7.15
Chipbelle	215	92	7.9	31.0	55.5	5.6	0.0	5	112	6.50	7.35	7.35	7.45
Monona	226	93	7.4	31.4	53.2	8.0	0.0	5	085	6.20	7.15	7.15	7.05
Norchip	223	88	12.2	53.7	34.1	0.0	0.0	5	098	6.80	7.85	7.85	7.30
Superior	238	94	6.0	31.7	58.4	3.9	0.0	5	093	6.90	8.00	8.00	6.85
Atlantic	257	90	9.5	47.1	40.2	3.1	0.0	6	112	6.35	7.35	7.35	6.60
Belchip	270	92	7.9	37.9	50.2	4.0	0.0	5	096	6.60	7.40	7.40	7.10
LSD 5%	37												

<sup>1,2,3</sup> See footnotes Table 2

<sup>4</sup> Chipped on 1/11/88

<sup>5</sup> Chipped on 2/1/88

<sup>6</sup> Chipped on 3/8/88

<sup>1,2,3</sup>See footnotes Table 2

<sup>4</sup>Chipped on 1/13/88

<sup>5</sup>Chipped on 1/28/88

<sup>6</sup>Chipped on 3/8/88



BARC Table 7. Yield, tuber size distribution, and quality characteristics of russets harvested 119 days after planting at Echo Lake in 1987.

Pedigree	Mkt CWT/A	%	Tuber size distribution					Tuber <sup>1</sup> Rating	Spec <sup>2</sup> Grav	French Fry <sup>3</sup>		
			< 2 oz	2-6 oz	6-10 oz	10-16 oz	> 16 oz			50° F <sup>4</sup>	40° F <sup>5</sup>	40° - 70° F <sup>6</sup>
B9569-2	205	79	21.2	49.7	26.7	1.7	0.7	5	084	3.35	4.50	3.90
B9596-2	281	88	11.7	49.7	36.0	2.5	0.0	7	088	2.10	3.35	2.40
B9922-11	324	94	6.4	37.8	48.3	6.8	0.6	5	102	2.00	3.20	2.20
B9924-22	250	88	12.1	47.8	38.4	1.7	0.0	5	094	2.00	3.60	2.20
B9932-30	152	61	38.6	43.1	18.3	0.0	0.0	6	101	2.20	3.75	2.40
B9932-50	206	82	17.9	43.9	35.0	3.3	0.0	5	103	2.00	2.85	2.25
B0036-6	293	91	9.4	35.6	45.6	7.2	2.2	5	097	1.85	3.00	2.25
B0039-6	194	78	22.5	53.5	22.6	1.4	0.0	4	083	2.00	3.50	2.40
B0045-6	223	78	22.4	50.7	25.4	1.5	0.0	5	106	2.05	2.55	2.35
B0180-18	300	96	3.9	31.8	51.9	11.0	1.4	5	082	1.90	3.10	2.20
B0180-31	185	74	25.5	46.2	28.3	0.0	0.0	4	090	2.30	3.55	2.50
B0180-39	305	94	5.9	30.0	48.6	14.4	1.6	5	084	2.00	2.20	2.20
B0184-15	195	81	19.1	53.4	26.9	0.6	0.0	5	096	2.00	2.90	1.85
B0184-16	193	78	22.1	53.3	23.9	0.6	0.0	5	092	2.00	2.70	1.95
Russette	226	87	12.6	48.0	38.3	1.1	0.0	5	096	2.05	2.70	2.20
Norking	244	85	15.0	48.9	31.4	3.9	0.7	6	091	2.05	2.90	2.60
R. Burbank	209	72	28.1	37.5	34.4	0.0	0.0	1	084	2.35	3.30	2.05
BelRus	186	78	22.1	53.1	24.8	0.0	0.0	6	096	1.90	2.75	2.50
LSD 5%	44											

<sup>1</sup>2 See footnotes Table 2

<sup>3</sup> French fry color 1-3=satisfactory

<sup>4</sup> Fried on 1/14/88

<sup>5</sup> Fried on 2/4/88

<sup>6</sup> Fried on 3/8/88

[illegible]

<sup>1,2,3</sup>See footnotes Table 8

<sup>4</sup>Fried on 1/14/88

<sup>5</sup>Fried on 2/3/88

<sup>6</sup>Fried on 3/9/88

## INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

J.B. Bamberg and R.E. Hanneman, Jr.

### Introduction of New Stocks

A total of 104 new introductions were added to the collection, received as true seed accessions. One of these accessions was from the 1986 expedition to Bolivia and was sent by one of the participants, Dr. K.A. Okada, INTA, Balcarce, Argentina. The remaining accessions were collected during the 1987 expedition to Bolivia, headed by Dr. R.W. Hoopes. These included new accessions of rare or disappearing species, and several collections of new species.

### Preservation and Increase of Stocks

Over 90% of the introductions in the collection are maintained as true seed. Satisfactory seed increases of 306 species introductions and intraspecific hybrids were obtained under glass, fiberglass or screen. This is approximately 75% more than the average number of stocks increased per year during the previous 5-year period. This improvement is attributed to the addition of a Fall (September-January) seed increase, seed increases in screenhouses during the Summer and cultural innovations which enhanced seed increase efficiency. An experiment was performed in which the timing and amount of fertilizer application was modified for half of the plants of each of the seed increase families. "Treatment" plants yielded an average of over twice the seeds of the "control" plants. Tuber increases of approximately 1,452 clonal stocks were accomplished.

Twenty-four clones and six families (28 genotypes) were placed into sterile culture. IR-1 now has 453 clones in vitro. A total of 712 tests were performed on these and other IR-1 stocks to monitor the presence of viruses and PSTV (potato spindle-tuber viroid) in the collection. Twenty clones were subjected to virus-freeing treatments (156 meristems), resulting in six new virus-free lines. Eighty-one percent of in vitro stocks are presently virus-free. Experiments related to efficient in vitro maintenance of IR-1 stocks continue. These include evaluation of virus elimination methods, media components and field performance of stocks which have been freed of virus and maintained in vitro.

Germination percentages of 1,413 seedlots were determined. This includes 288 germination tests related to an experiment in which the efficacy of long term refrigeration was evaluated.

### Classification

Taxonomic determinations were made on field plantings and herbarium specimens by Drs. J.G. Hawkes, R.W. Hoopes and C.M. Ochoa. Their determinations indicated that several accessions from the recent expedition to Bolivia represent previously undescribed species. Over 1,160 plots were observed and

taxonomic determinations were newly assigned, confirmed, corrected or revised. Paper and computerized records were updated accordingly. Dr. D.M. Spooner was hired as a USDA, ARS taxonomist associated with IR-1 and participated in these determinations. Over 400 herbarium sheets were made from these plantings by A. Salas, International Potato Center, and sent to the Smithsonian herbarium. IR-1 personnel made and mounted an additional 302 specimens. A total of well over 5,000 sheets, representing nearly 115 potato species, are now available in the IR-1 herbarium for taxonomic study.

#### Distribution of Stocks

Shipments of seed, tuber, and in vitro stocks were sent to potato workers in 28 states of the United States and to workers in 18 other countries in response to requests. The volume and types of stocks sent to various consignee categories is summarized in the table below:

Volume and Types of Stocks Distributed

Category	Units <sup>1</sup> Ordered						Total
	S	TF	TC	IVS	RPS	Other	
Domestic	6,049	1,380	239	182	621	419	8,890
Foreign	1,164	142	47	91	18	34	1,496
Quarantine	103	0	0	0	0	0	103
Screening	1,530	49	0	0	0	0	1,579
IR-1 use <sup>2</sup>	3,863	2	1,452	7	0	691	6,015
Total	12,709	1,573	1,738	280	639	1,144	18,083

1/ Types of stocks sent/(Number of seeds, tubers or plantlets per standard shipping unit): S=True Seeds/(50), TF=Tuber Families/(21), TC=Tuber Clones/(4), IVS=in vitro Stocks (1), RPS=USDA-WI Cooperative Research Program Stocks, Other=plants, herbarium specimens, pollen, demonstration/teaching materials, leaf samples.

2/ Includes chromosome counts, germination tests, ID and taxonomic check plantings, in vitro maintenance, seed increases, PSTV tests, research and miscellaneous plantings.

The tuber families orders listed above were requested from a listing of 158 accessions mailed to approximately 350 cooperators world-wide. Tuber families propagated for 1988 distribution were reduced from the usual 21 clones per accession to 10 clones per accession. This allowed the offering of a diverse sample of species and accessions while saving greenhouse space needed for seed increases.

### Domestic Distributions by Region

Region	Units		Orders	
	shipped	% of total	shipped	% of total
North Central	2,559	29	71	51
North Eastern	4,630	52	29	21
Southern	551	6	10	7
Western	1,150	13	30	21
TOTAL	8,890	100	140	100

About 400 copies of the updated "Inventory of Tuber-bearing *Solanum* species" were distributed to cooperators this year. An electronic version of this inventory was loaded into the Germplasm Resources Information Network (GRIN) federal germplasm computer system. Cooperators now have the advantages of electronic search and ranking capabilities to help them in selection of stocks most suited to their research.

#### Evaluation of Stocks

The somatic chromosome numbers of 340 accessions were determined in the laboratory.

Funds for contracts to state and federal laboratories were provided by USDA, ARS for screening for various economic traits. Distributions for screening purposes are summarized in the following table:

#### Contract Screening, 1987

Contract	Trait	Accessions	Units
K. Deahl	Glycoalkaloids	360	360
A. Kelman	Blackleg ( <i>Erwinia</i> )	323	646
S. Slack	Ringrot ( <i>Corynebacterium</i> )	237	474
D. Carling	<i>Rhizoctonia</i>	99	99
TOTAL		1,019	1,579

The collection is steadily being evaluated for characteristics of economic importance through the research efforts of state, federal, and foreign laboratories.

#### Usefulness of Findings

The major objective of the Inter-Regional Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germplasm and for ways to incorporate desirable genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the success with which new improved varieties meet the needs of commercial production.

Of the 179 potato varieties developed and released in the United States since 1932, 174 are known to have two or more foreign introductions in their pedigrees. These varieties represent about 65% of the annual seed potato production in the United States.



Basic research programs conducted in the United States and other countries continue to provide information concerning the potential value and necessity of more effective utilization of the IR-1 germplasm collection. During 1987, 55 papers, 35 abstracts, and 12 theses reported the use of *Solanum* introductions.

The Inter-Regional  
Potato Introduction  
Project's Inventory  
of Tuber-bearing  
Solanum species.

The Inter-Regional Potato Introduction Project (IR-1) is charged with the introduction, classification, maintenance, distribution and preliminary evaluation preliminary evaluation of accessions which become part of the IR-1 collection. Fulfillment of this responsibility includes periodic publication of an inventory containing the identities of these accessions and any associated descriptive information. This serves as a catalog of stocks which may be requested by potato scientists for use in their research. The latest edition of this document, the "Inventory of Tuber-bearing *Solanum* species", bulletin 533 of the College of Agriculture and Life Sciences, University of Wisconsin-Madison has now been published.

Each of the approximately 3,000 accessions listed has been identified by its species and subspecies names, Plant Introduction (PI) and collection number. The country of origin, form received, form available, chromosome number and crossability group have also been listed. Reactions to frost, heat/drought, viruses, fungi, bacteria, nematodes and insects are given if available. These designations are a summary of published and unpublished reports and contracted screening results. Data contained in this inventory have also been computerized to facilitate selection and ordering of accessions which meet a combination of criteria. This inventory may be obtained free of charge by contacting the Potato Introduction Station, Sturgeon Bay, WI 54235; Ph. (414) 743-5406.

## NORTH CENTRAL REGIONAL POTATO TRIALS

R. H. Johansen and Cooperators<sup>1/</sup>

The year 1987 marked the 37th year that the North Central Regional Potato Variety Trials have been conducted. Many of the varieties grown today in the United States and Canada were at one time grown in this trial. Presently, 12 states and three Canadian provinces are conducting trials. Ontario became a new member of the trials in 1987. This past season Louisiana lost their trial due to flooding and poor growing conditions.

### Cultivars Released in 1987:

Russet Norkotah

Progeny No. ND534-4Russ

Released by: North Dakota

Parentage: ND9526-4Russ x ND9687-5Russ

### Cooperating States and Provinces:

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Alberta	5/15	9/25	134
Manitoba	5/7	9/8	125
Ontario	5/15	9/23	140
Indiana	4/7	7/29	145
Iowa	4/16	7/30	106
Kentucky	4/10	9/8	153
Michigan	5/5	9/16	135
Minnesota	4/9	8/18	132
Missouri	3/23	8/19	150
Nebraska	5/3	10/1	145
North Dakota	5/11	9/16	129
Ohio	5/14	9/21	131
South Dakota	4/24	8/4	103
Wisconsin	4/24	9/23	153

**Environmental Conditions.** Soil types ranged from clay loam to sand. However, most of the soil types ranged from silt to sandy loam. Irrigation was used at some locations.

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<sup>1/</sup> Alberta, Mr. Clive Schaupmeyer; Manitoba, Mr. Brian Rex; Ontario, Dr. Robert Coffin; Indiana, Dr. Hommer Erickson; Iowa, Dr. Bill Summers, Kentucky, Dr. John Snyder; Louisiana, Dr. James Fontenot; Michigan, Dr. Richard Chase; Minnesota, Dr. Florian Lauer; Missouri, Dr. V. N. Lambeth; Nebraska, Dr. R.B. O'Keefe; Ohio, Dr. Mark A. Bennett; South Dakota, Dr. Paul Prashar; Wisconsin, Mr. Donald Kichefski, Dr. Stan Peloquin.

**Cultural Practices.** Fertilizer, fungicides, insecticides, vine killers, herbicides, etc. were all based on local conditions. Insecticides used were Thiodan (endosulfan), disyston, Monitor, Furadan, Imidan, Sevin, Marlate, Thimet, Diazinon, Pounce, Pydrin, Cygon, Malathion, PennCap, Asana and Guthion. Fungicides used were Dithane M22 (Maneb), defolatan (Captafol), Bravo, Dithane M-45, Mancozeb, Super Tin and Manzate 200. The herbicides used were Poast (Sethoxydim), Sencor (metribuzin), Lorox, Eptam and Dual + Lexone. Vines were killed mechanically or by Diquat, Reglone and Herbimax.

**Weather Conditions.** In the Northern states and provinces, temperatures were generally quite warm early in the spring. Iowa had 20 days of 100°F+ temperature during July and Missouri had severe water and heat stress throughout July. Above normal temperatures occurred in Indiana, Iowa, Missouri and South Dakota. However, in general, growing conditions were near normal for most locations.

**Entries.** Entries for the 1987 trial were received from Michigan, Wisconsin, Nebraska, North Dakota and Minnesota. The check varieties Red Pontiac, Norland, Norchip and Super Norgold Russet were supplied by North Dakota. Russet Burbank was dropped as a check variety in 1987.

**Total and U.S. No. 1 Yield.** Red Pontiac produced the highest total and U.S. No. 1 yield, however several other selections including NDT-9-1068-11R, MN12567, and MS700-70 also produced very good yields. This was the second year that NDT-9-1068-11R has been in trial and it again expressed very high yield potential. The Alberta trial produced the highest yield while Nebraska produced the lowest. Yield results are found in North Central Regional Tables 1 and 2.

**Percent U.S. No. 1.** Minnesota and Wisconsin produced the highest percent U.S. No. 1. When comparing entries, MN12331 produced the lowest percent U.S. No. 1 while Norland and W921 produced the highest (North Central Regional Table 3).

**Maturity.** Maturity is reported in North Central Regional Table 4. Norland and ND651-9 were the earliest maturing while MS700-70 was the latest. MN12945 appeared to be almost as early as ND651-9 and not much later than Norland.

**Percent Total Solids.** MS700-70 and MS716-15 had the highest percent total solids (both were over 20%). Other entries with high total solids were Norchip, W921 and W832. MN12945 produced the lowest percent total solids. When comparing locations, the trial at Alberta produced the highest percent total solids while Ohio produced the lowest (North Central Regional Table 5).



**Scab Reaction.** Nebraska again reported the most severe scab. Scab readings at some locations were not taken as instructed, or by the accurate or established method, therefore making it difficult to summarize data (North Central Regional Table 6).

**Summary of Grade Defects.** Grade defects again varied from location to location. Nebraska, Ontario and Indiana reported the most severe scab. Kentucky noted a high amount of second growth for several entries. Hollow heart was a problem in Ontario, Indiana and Kentucky. Grade defects are found in North Central Regional Table 7. Certain entries are starred (\*) to point out a weakness of a selection.

**Chip Color.** Chip color, either Agtron or Color Chart, is found in North Central Regional Table 8. Iowa, Minnesota and South Dakota did not report any chip data. W921, W848, MN12331, MS716-15, MS700-83, MS700-70, NEA219.70-3, BN9803-1, W832 and ND651-9 all appeared to express good chip quality. Michigan reported that they used the new Agtron E10 ratio color model for which numbers of 60 and above indicate excellent chip color.

**Early Blight Readings.** This year, only six cooperators reported early blight readings (North Central Regional Table 9).

**Overall Merit Ratings<sup>1/</sup>** Merit ratings for 1987 are found in North Central Regional Table 10. Two Michigan, one Minnesota, one Wisconsin and one North Dakota entries had the highest overall merit ratings in the 1987 North Central Regional Potato Variety Trial. For comparison, the following table shows merit ratings for the years 1985-1986 and 1987.

Selection	Total Points		
	1985	1986	1987
MS716-15	23	0	34
NDT-9-1068-11R	0	24	22
MS700-83	10	23	20
MN12567	0	12	20
W848	0	0	20

Merit Ratings<sup>1/</sup>

Rating	Points
1	5
2	4
3	3
4	2
5	1

North Central Regional Trial Table 1. Total Yield (Cwt/Acre) - 1987.

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MT	MN	MO	NE	OH	ND	SD	WI	Ave.
<u>Early to Medium Early</u>															
Norland	396	238	360	278	367	90	427	489	95	60	269	248	315	391	287
ND651-9	548	183	377	439	332	144	332	574	120	49	212	243	334	388	305
W832	355	144	371	453	343	199	381	471	172	47	202	255	355	485	302
EN9803	477	141	323	241	283	41	330	480	NS	52	155	203	266	459	265
NEA219.70-3	253	180	330	300	271	159	343	494	NS	59	205	252	315	438	277
<u>Medium to Late</u>															
MS700-70	436	185	393	420	241	196	574	552	143	102	276	280	384	740	352
MS700-83	441	201	365	463	323	148	484	515	132	100	264	324	374	445	327
MS716-15	434	183	346	426	319	182	398	532	138	38	259	259	374	422	308
MN12331	485	175	185	300	236	87	207	449	82	52	209	250	269	352	238
MN12567	508	193	276	489	342	196	466	739	89	48	227	305	441	598	351
MN12945	383	86	308	172	ROT	107	217	572	44	23	202	243	277	440	236
NEA71.72-1	498	156	279	320	313	184	244	494	NS	30	97	217	264	472	274
ND671-4	490	161	408	261	226	157	291	508	49	42	177	216	200	411	257
ND79-1068-11R	218	234	467	415	437	207	504	629	155	56	219	335	399	615	349
W848	437	162	290	392	250	158	370	563	220	64	177	234	346	483	296
W921	474	171	376	289	206	145	405	452	149	65	242	177	319	459	281
Red Pontiac	358	201	453	535	322	261	557	674	251	110	239	320	425	737	389
Super Norgold Russet	597	172	297	381	358	151	338	442	88	92	267	286	274	376	294
Norchip	465	212	407	452	283	140	440	530	229	49	311	270	359	414	326
Russet Burbank		156													156
Average	434	177	348	370	303	155	385	535	135	60	222	259	331	480	299

NS - No seed was received

North Central Regional Trial Table 2. U.S. No. 1 Yield (Ont/Acre) - 1987.

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MI	MN	MO	NE	OH	ND	SD	WI	Ave.
<u>Early to Medium Early</u>															
Norland	558	260	387	302	391	112	451	498	123	77	373	273	337	425	326
ND651-9	696	222	435	462	353	167	384	595	157	136	321	279	370	452	359
W832	538	157	403	492	272	220	412	484	226	104	308	275	368	493	339
BN9803	573	178	373	294	314	68	375	503	NS	65	284	244	316	507	315
NEA219.70-3	693	203	360	345	291	187	363	501	NS	71	293	270	331	465	336
<u>Medium to Late</u>															
MS700-70	627	214	448	438	255	206	603	559	192	154	386	301	411	758	397
MS700-83	683	219	417	498	364	178	538	539	180	139	392	351	421	491	386
MS716-15	630	221	390	453	342	212	434	540	192	55	329	286	408	447	353
MN12331	587	232	264	406	276	139	410	469	117	74	309	286	301	421	307
MN12567	660	217	312	556	368	220	536	744	138	68	359	334	474	633	401
MN12945	561	142	358	202	248	119	321	586	52	40	271	298	300	480	284
NEA71.72-1	619	202	335	368	358	206	354	501	NS	43	242	260	314	539	334
ND671-4	601	197	460	326	283	183	399	523	76	54	291	235	276	477	313
NDT9-1068-11R	645	268	533	446	454	216	548	642	204	93	317	369	410	645	414
W848	655	193	327	396	359	176	405	577	255	108	282	258	359	498	346
W921	660	194	419	336	258	180	441	471	192	82	242	204	343	498	323
Red Pontiac	779	252	521	552	332	284	638	694	297	168	421	351	441	783	465
Super Norgold Russet	645	208	343	419	398	186	413	461	170	114	412	326	323	421	346
Norchip	554	246	456	486	306	160	494	539	278	94	436	329	403	443	373
Russet Burbank	204														204
Average	630	211	397	409	327	180	448	549	178	92	330	291	363	520	351

NS - No seed was received

North Central Regional Trial Table 3. Average percent U.S. No. 1 (over 2" diameter) - 1987

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MT	MN	MO	NE	OH	ND	SD	WI	Ave.
<u>Early to</u>															
<u>Medium early</u>															
Norland	71	92	93	92	94	80	95	98	77	78	72	91	93	92	87
ND651-9	79	82	87	95	94	86	87	96	76	36	66	87	90	86	82
W832	66	92	92	92	95	91	92	97	76	46	66	93	96	98	85
BN9803	83	80	90	82	90	60	88	96	NS	80	54	83	84	91	82
NEA219.70-3	36	89	92	87	93	85	94	98	NS	82	70	93	95	94	85
<u>Medium to Late</u>															
MS700-70	70	86	88	96	95	89	95	99	74	72	72	93	93	98	87
MS700-83	65	92	88	93	89	83	90	96	74	67	67	92	89	91	84
MS716-15	69	83	89	94	93	86	92	98	72	68	79	91	92	94	86
MN12331	83	76	70	74	86	61	50	96	70	70	68	88	89	84	76
MN12567	77	89	88	88	93	89	87	99	65	70	63	91	93	94	85
MN12945	68	61	86	85	ROT	89	67	98	84	58	74	82	92	92	80
NEA71.72-1	80	77	83	87	88	89	69	98	NS	70	40	84	84	88	80
ND671-4	82	82	89	80	80	85	73	97	65	78	61	92	72	86	80
NDT9-1068-11R	34	87	88	93	96	96	93	98	76	61	69	91	97	95	84
W848	67	84	89	99	92	90	91	98	86	59	63	90	96	97	86
W921	72	88	90	86	80	81	92	96	78	79	100	87	93	92	87
Red Pontiac	46	80	87	97	97	92	87	97	85	65	57	91	96	94	84
Super Norgold Russet	93	83	87	91	90	81	82	96	52	81	65	88	85	89	83
Norchip	84	86	89	93	93	87	89	98	82	52	71	82	89	93	85
Russet Burbank	77														77
Average	70	83	88	90	91	84	85	97	75	67	67	89	90	92	83

NS - No seed was received

North Central Regional Trial Table 4. Maturity Classification<sup>1/</sup> - 1987.

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MI	MN	MO	NE	OH	ND	SD	WI	Ave.
<u>Early to Medium Early</u>															
Norland	2.0	1.0	ND	1.0	1.0	1.0	2.0	ND	1.0	2.0	1.0	1.8	1.0	2.0	1.4
ND651-9	3.0	1.0	ND	2.8	1.0	2.0	2.5	ND	2.5	1.0	1.0	2.3	1.0	2.7	1.9
W832	4.0	2.0	ND	4.2	2.0	3.8	3.5	ND	3.0	2.0	3.0	3.5	3.0	3.6	3.1
EN9803	4.0	2.0	ND	2.5	2.0	1.3	3.0	ND	NS	1.0	2.0	3.5	1.0	2.4	2.2
NEA219.70-3	4.0	3.0	ND	4.2	2.0	3.0	3.0	ND	NS	1.0	2.0	3.3	3.0	2.9	2.9
<u>Medium to Late</u>															
MS700-70	5.0	5.0	ND	4.8	4.0	4.8	4.5	ND	3.5	3.0	4.0	4.5	5.0	4.2	4.4
MS700-83	4.0	3.0	ND	3.8	3.0	4.3	3.5	ND	3.0	3.0	2.0	3.3	3.0	3.2	3.3
MS716-15	5.0	3.0	ND	4.0	4.0	4.8	4.0	ND	3.0	2.0	3.0	4.0	3.0	3.3	3.6
MM12331	4.0	3.0	ND	3.5	3.0	1.8	3.0	ND	3.0	2.0	2.0	3.0	2.0	2.4	2.7
MM12567	4.0	3.0	ND	4.0	3.0	3.5	3.5	ND	3.0	2.0	3.0	3.0	4.0	3.3	3.3
MM12945	2.0	1.0	ND	1.0	3.0	1.8	3.0	ND	2.5	2.0	1.0	2.3	2.0	2.1	2.0
NEA71.72-1	4.5	4.0	ND	3.5	3.0	2.8	4.0	ND	NS	3.0	3.0	3.8	4.0	3.2	3.5
ND671-4	3.0	2.0	ND	3.2	3.0	3.0	3.0	ND	4.0	3.0	3.0	4.0	1.0	3.6	3.0
NDT9-1068-11R	4.5	4.0	ND	3.0	4.0	4.0	3.5	ND	4.0	3.0	3.0	3.5	3.0	3.4	3.6
W848	5.0	4.0	ND	4.5	3.0	4.8	4.0	ND	3.5	3.0	3.0	4.8	3.0	3.6	3.9
W921	5.0	5.0	ND	3.8	3.0	4.0	4.0	ND	3.5	2.0	3.0	4.8	4.0	4.1	3.9
Red Pontiac	5.0	4.0	ND	3.5	4.0	4.8	4.5	ND	3.0	3.0	3.0	4.5	4.0	4.5	4.0
Super Norgold Russet	3.0	2.0	ND	2.0	3.0	2.5	3.5	ND	3.5	2.0	1.0	2.8	2.0	2.3	2.5
Norchip	4.0	4.6	ND	4.0	3.0	4.5	3.5	ND	3.0	3.0	3.0	3.3	4.0	3.2	3.6
Russet Burbank		5.0													5.0
Average	3.9	3.1	ND	3.3	3.0	6.7	3.4	2.6	2.9	2.3	2.4	3.5	2.8	3.2	3.6

- <sup>1/</sup> 1. Very Early - Norland Maturity  
2. Early - Irish Cobbler Maturity  
3. Medium - Red Pontiac Maturity  
4. Late - Katahdin Maturity  
5. Very Late - Russet Burbank
- ND - No data reported  
NS - No seed was received



North Central Regional Trial Table 5. Percent Total Solids - 1987.

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MI	MN	MO	NE	OH	ND	SD	WI	Ave.
<u>Early to</u>															
<u>Medium Early</u>															
Norland	20.5	18.0	15.6	13.7	14.0	16.3	15.8	14.1	14.5	16.5	11.0	18.8	16.3	13.7	15.6
ND651-9	21.4	20.5	19.6	15.2	16.0	18.4	17.5	19.0	16.9	17.1	13.0	20.5	17.3	15.6	17.7
W832	23.0	22.3	22.1	16.9	18.2	19.7	19.9	19.2	18.6	20.1	14.2	22.0	20.0	18.0	19.6
BN9803	24.0	22.3	20.8	16.7	17.9	18.4	18.4	19.5	NS	18.2	15.6	22.7	18.9	18.2	19.4
NEA219.70-3	23.8	21.5	19.0	14.1	14.9	16.1	16.5	16.7	NS	19.2	11.6	20.7	17.7	16.0	17.5
<u>Medium to Late</u>															
MST00-70	22.5	23.8	22.3	16.3	19.6	21.2	20.1	18.6	17.7	22.0	14.4	22.7	19.8	19.7	20.1
MST00-83	21.0	20.5	21.5	15.2	16.9	18.2	17.7	16.5	16.0	20.9	13.8	21.8	18.0	15.8	18.1
MST16-15	24.2	24.8	23.4	16.9	18.6	21.2	20.1	19.5	16.2	18.6	15.7	22.9	20.2	19.4	20.1
MN12331	25.0	21.3	18.7	15.5	14.9	16.5	16.0	14.8	15.2	18.2	11.6	22.0	16.7	15.0	17.2
MN12567	20.5	20.3	19.4	14.5	15.2	17.6	17.3	16.7	14.8	18.4	13.8	20.3	18.0	16.0	17.3
MN12945	18.0	16.5	15.6	13.7	ROT	15.0	12.2	14.8	14.3	17.5	10.4	17.5	15.4	13.7	15.0
NEA71.72-1	19.5	20.5	19.2	14.3	14.4	17.8	17.7	16.7	NS	19.2	13.0	20.7	17.8	15.6	17.4
ND671-4	23.0	20.0	19.2	15.0	14.8	18.4	16.5	16.5	15.0	18.6	11.8	19.9	16.7	14.3	17.1
NDT9-1068-11R	19.9	19.8	17.5	13.9	14.2	17.4	17.3	14.5	14.3	18.8	11.8	18.6	16.7	14.5	16.4
W848	21.5	22.8	21.7	15.8	18.1	19.4	18.2	17.3	16.7	23.1	12.6	20.7	18.2	17.3	18.8
W921	22.5	23.8	21.7	16.0	17.4	19.7	19.7	19.5	17.1	19.4	14.4	22.2	18.4	17.5	19.2
Red Pontiac	20.8	19.0	17.0	13.9	13.9	15.7	15.8	15.2	14.3	16.2	10.2	18.6	16.0	14.8	15.8
Super Norgold Russet	23.8	20.3	17.3	14.1	14.5	16.9	17.5	15.8	14.3	19.0	11.4	20.7	17.3	14.8	17.0
Norchip	23.3	21.3	21.5	16.9	18.2	19.1	19.0	18.2	17.7	20.1	13.8	21.6	18.2	18.0	19.1
Russet Burbank	23.0														23.0
Average	22.0	21.1	19.6	15.2	16.2	18.1	17.5	17.0	15.9	19.0	12.8	20.8	17.8	16.2	17.7

NS - No seed was received

North Central Regional Trial Table 6. Scab Reaction Report. Most Representative Scab (Area-Type)<sup>1/</sup> - 1987.

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MI	MN <sup>2/</sup>	MO	NE	OH	ND	SD <sup>3/</sup>	WI
<u>Early to</u>														
<u>Medium Early</u>														
Norland	T-1	1-1	ND	3-2	T-3	T-1	0	3-M	T-1	1-1	0	T-1	1	0-0
ND651-9	T-1	T-1	ND	4-3	ND	T-1	0	4-H	T-1	2-3	0	T-1	1	2-4
W832	T-1	T-1	ND	2-3	1-3	3-2	T-1	0	1-2	2-2	0	1-4	1	3-4
EN9803	T-1	T-1	ND	3-1	T-1	T-1	0	3-M	NS	T-2	0	T-1	1	0-0
NEA219.70-3	T-1	1-1	ND	3-4	1-3	2-3	0	2-L	NS	T-1	3-1	T-1	1	2-3
<u>Medium to Late</u>														
MS700-70	T-1	T-1	ND	4-2	ND	T-1	T-1	3-M	T-1	1-3	0	T-1	7	0-0
MS700-83	T-1	T-1	ND	4-2	T-2	T-1	T-1	4-M	1-1	1-4	T-1	1-1	2	0-0
MS716-15	T-1	T-1	ND	2-2	0-0	T-1	1-3	4-M	T-1	1-4	0	T-1	1	0-0
MN12331	T-1	0	ND	3-3	0-0	T-1	0	1-L	T-1	T-1	0	0-0	1	0-0
MN12567	T-1	T-1	ND	2-2	0-0	T-1	0	1-L	T-1	T-1	0	T-1	1	0-0
MN12945	T-1	0	ND	3-2	ND	T-1	0	5-M	1-1	2-4	0	T-1	1	2-4
NEA71.72-1	T-1	T-1	ND	1-3	0-0	T-1	0	4-H	NS	1-2	0	1-1	1	2-4
ND671-4	T-1	0	ND	1-2	0-0	T-1	0	1-L	T-1	T-1	0	0-0	0	0-0
NDT9-1068-11R	T-1	T-1	ND	2-3	0-0	T-1	0	5-M	T-1	1-3	0	T-1	1	2-5
W848	T-1	0	ND	3-2	T-3	T-1	T-1	0	1-2	1-3	0	1-1	1	1-4
W921	T-1	T-1	ND	2-3	ND	T-1	0	0	T-1	T-1	0	T-1	1	0-0
Red Pontiac	T-1	1-1	ND	3-1	T-1	T-1	1-3	5-M	T-1	2-3	0	1-1	0	2-5
Super Norgold Russet	T-1	T-1	ND	1-2	T-1	T-1	0	1-L	T-1	T-1	0	0-0	1	0-0
Norchip	T-1	T-1	ND	4-2	ND	T-1	T-1	3-H	T-1	2-3	0	T-1	0	2-2
Russet Burbank	0													

1/ AREA

TYPE

T = less than 1%

1 = 1-20%

2 = 21-40%

3 = 41-60%

4 = 51-80%

2/ Dr. Florian Lauer's scab readings

3/ Dr. Paul Prashar's scab readings

NS - No seed was received

ND - No data reported.

1 = Small, superficial

2 = Larger, superficial

3 = Larger, rough pustules

4 = Larger pustules, shallow eyes

5 = Very large pustules, deep holes

North Central Regional Trial Table 7. Summary of Grade Defects - 1987.

Cultivar or Selection	External				Total Free of <sup>1/</sup> Ext. Defects	Hollow Heart	Internal Necrosis	Internal	
	Scab	Growth Cracks	Second Growth	Sun Green				Vascular Discol- oration	Total Free of <sup>1</sup> Int. Def.
Early to									
Medium Early									
Norland	14.2	4.2	0.8	1.0	79.4	1.3	3.9	4.4	91.3
ND651-9	26.5**	4.3	0.9	2.2	67.6	0.2	0.7	5.8	93.3
W832	21.1**	2.6	2.4	2.0	74.6	11.5**	0.2	3.3*	84.0
BN9803-1	11.4	2.5	0.6	2.1	83.8	2.8	0.7	7.6**	89.2
NEA219.70-3	18.4**	2.9	1.4	2.5	76.9	3.2	1.2	6.4	89.8
Medium to Late									
MS700-70	9.6	2.2	1.5	5.2	81.8	4.3**	3.5	2.2	89.5
MS700-83	18.4**	4.8**	0.6	2.0	75.0	0.9	1.1	4.9	96.5
MS716-15	9.4	1.0	0.9	2.2	87.2	0.4	0.1	5.2	94.2
MN12331	8.6	2.4	6.2**	1.2	84.1	0.7	0.1	5.7	93.4
MN12567	10.3	1.9	5.4	2.8	81.6	0.1	3.3	6.0	91.2
MN12945	13.5	3.9	4.1	0.9	82.2	0.1	5.2	3.6	89.8
NEA71.72-1	13.2	2.0	2.5	2.5	79.4	4.8**	7.3**	6.6	81.5
ND671-4Russ	5.4	2.9	2.3	1.8	89.1	2.0	4.1	3.1	90.7
NDT-9-1068-11R	6.7	4.5	2.4	2.1	85.1	0.6	1.7	5.6	91.3
W848	8.8	4.1	3.9	5.1	79.3	0.1	0.9	5.6	93.7
W921	5.1	2.8	2.4	1.7	88.5	0.5	0.3	2.5	96.8
Red Pontiac	14.9	3.5	6.3**	1.2	76.6	1.2	1.8	3.2	87.6
Super Norgold	8.4	2.9	7.0**	1.1	80.3	3.9	0.1	2.7	93.3
Norchip	14.8	6.2	5.8	5.2	70.2	0.2	6.9	3.4	89.2

<sup>1/</sup> Percent normal tubers showing no defects (some individuals had more than one type of defect).

\*\* Possible weakness of cultivar or clone.



North Central Regional Trial Table 8. Chip Quality - 1987.

Cultivar or Selection	Alb. 2/	Man. 2/	Ont. 2/	IN <sup>1/</sup>	IA	KY 2/	MI 2/	MN	MO 2/	NE 1/	OH 1/	ND 2/	SD	WI 1/
<u>Early to Medium Early</u>														
Norland	23	49	63	3.0	ND	61	57	ND	47	6.0	2.0	31	ND	6.0
ND651-9	40	60	70	1.5	ND	66	60	ND	78	3.0	2.0	43	ND	4.7
W832	51	58	66	1.0	ND	57	62	ND	70	2.0	2.0	46	ND	3.8
EN9803	43	42	64	2.0	ND	68	56	ND	NS	3.0	2.0	41	ND	3.3
NEA219.70-3	34	59	66	1.0	ND	62	68	ND	NS	2.0	3.0	38	ND	3.6
<u>Medium to Late</u>														
MS700-70	83	57	68	1.0	ND	62	60	ND	59	3.0	2.0	39	ND	4.2
MS700-83	28	51	71	1.0	ND	63	62	ND	62	2.0	2.0	35	ND	4.7
MS716-15	32	57	68	1.0	ND	63	70	ND	58	2.0	1.0	41	ND	4.7
MN12331	44	53	69	1.5	ND	56	59	ND	64	3.0	2.0	41	ND	4.9
MN12567	26	53	65	2.5	ND	57	60	ND	76	3.0	2.0	39	ND	6.2
MN12945	15	41	59	2.5	ND	55	52	ND	58	3.0	2.0	35	ND	6.0
NEA71.72-1	26	47	61	4.5	ND	53	61	ND	NS	3.0	2.0	40	ND	5.0
ND671-4	24	46	62	2.0	ND	61	54	ND	50	5.0	2.0	31	ND	5.5
NDT9-1068-11R	15	26	62	3.0	ND	51	37	ND	52	4.0	3.0	41	ND	9.0
W848	44	61	69	1.0	ND	63	52	ND	75	3.0	2.0	25	ND	3.8
W921	57	63	71	2.0	ND	57	78	ND	64	2.0	3.0	39	ND	3.1
Red Pontiac	16	34	42	3.5	ND	53	42	ND	38	4.0	4.0	29	ND	9.0
Super Norgold	20	36	40	4.0	ND	48	35	ND	40	3.0	4.0	22	ND	9.0
Russet	43	52	70	1.5	ND	60	67	ND	61	3.0	2.0	41	ND	4.1
Russet Burbank	50													
Average	35	50	64	2.1	ND	59	58	ND	56	3.1	2.3	37	ND	5.3

1/ PCTI Color Chart (1 = lightest; 10 = darkest)

2/ Agron (Highest number lightest)

NS - No seed was received

ND - No data reported

North Central Regional Trial Table 9. Early Blight<sup>1/</sup> - 1987

Cultivar or Selection	ALB.	MAN.	ONT.	IN	IA	KY	MI	MN	MO	NE	OH	ND	SD	WI	AVE.
<u>Early to</u>															
<u>Medium Early</u>															
Norland	ND	ND	ND	ND	ND	ND	3.5	1.0	ND	4.0	ND	ND	ND	ND	2.8
ND651-9	ND	ND	ND	ND	ND	ND	3.5	2.0	ND	ND	ND	ND	ND	ND	2.8
W832	ND	ND	ND	ND	ND	ND	4.5	4.0	ND	4.0	ND	ND	ND	ND	4.2
BN9803	ND	ND	ND	ND	ND	ND	4.0	2.0	NS	ND	ND	ND	ND	ND	3.0
NEA219.70-3	ND	ND	ND	ND	ND	ND	3.5	3.0	NS	ND	ND	ND	ND	ND	3.3
<u>Medium to Late</u>															
MS700-70	ND	ND	ND	ND	ND	ND	5.0	3.0	ND	3.0	ND	ND	ND	ND	3.7
MS700-83	ND	ND	ND	ND	ND	ND	4.5	4.0	ND	3.0	ND	ND	ND	ND	3.8
MS716-15	ND	ND	ND	ND	ND	ND	4.5	3.0	ND	4.0	ND	ND	ND	ND	3.8
MN12331	ND	ND	ND	ND	ND	ND	4.0	1.0	ND	3.0	ND	ND	ND	ND	2.7
MN12567	ND	ND	ND	ND	ND	ND	4.0	1.0	ND	2.0	ND	ND	ND	ND	2.3
MN12945	ND	ND	ND	ND	ND	ND	4.0	1.0	ND	ND	ND	ND	ND	ND	2.5
NEA71.72-1	ND	ND	ND	ND	ND	ND	5.0	3.0	NS	4.0	ND	ND	ND	ND	4.0
ND671-4	ND	ND	ND	ND	ND	ND	3.5	2.0	ND	4.0	ND	ND	ND	ND	3.2
NDT9-1068-11R	ND	ND	ND	ND	ND	ND	4.0	2.0	ND	1.0	ND	ND	ND	ND	2.3
W848	ND	ND	ND	ND	ND	ND	4.5	2.0	ND	4.0	ND	ND	ND	ND	3.5
W921	ND	ND	ND	ND	ND	ND	4.5	5.0	ND	4.0	ND	ND	ND	ND	4.5
Red Pontiac	ND	ND	ND	ND	ND	ND	4.0	3.0	ND	1.0	ND	ND	ND	ND	2.7
Super Norgold Russet	ND	ND	ND	ND	ND	ND	3.5	2.0	ND	ND	ND	ND	ND	ND	1.8
Norchip	ND	ND	ND	ND	ND	ND	3.0	2.0	ND	4.0	ND	ND	ND	ND	3.0
Russet Burbank	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	0.0
Average	ND	ND	ND	ND	ND	ND	4.1	2.4	ND	3.2	ND	ND	ND	ND	3.2

ND - No Data - Seed was sent; however cooperators did not report data.

<sup>1/</sup> Early Blight: 1 = susceptible; 5 = highly resistant; 0 = no disease

North Central Regional Trial Table 10. Merit Ratings 1/ - 1987

Cultivar or Selection	Alb.	Man.	Ont.	IN	IA	KY	MI	MN	MO	NE	OH	ND	SD	WI	Total Points
<u>Early to Medium Early</u>															
Norland		5													5
ND651-9	3										1				4
W832						3			2		3			4	12
BN9803				1				2						2	5
NEA219.70-3															0
<u>Medium to Late</u>															
MS700-70		1				2			1	5	5		4		18
MS700-83			2				5			4			2	3	20
MS716-15	4	2	5	4		4	4					1		5	34
MN12331															0
MN12567						5	2	5				3	5		20
MN12945	1											2			3
NEA71.72-1															0
ND6711-4	5					1	3	4				4			17
NDT9-1068-11R			3	2	5			1			2	5	3	1	22
W848	2		4	4	2			3	4	1					20
W921			1	1					3						5
Red Pontiac		3								2					5
Norgold							1			3					5
Norohip					3								1		7
Russet Burbank		4		3					5						13

1/ Merit Ratings

Rating	Points
1	5
2	4
3	3
4	2
5	1

# WESTERN REGIONAL POTATO VARIETY TRIAL - 1987

J. J. Pavek, D. L. Corsini, and Cooperators<sup>1/</sup>

## Uniform Potato Yield Trial

The 1987 trial was grown at ten locations for yield and two for disease data. It consisted of 12 entries, 8 experimental and four standard checks. Three locations grew all the entries for early harvest as well as late harvest. The trial locations, dates of planting, vine killing, and harvest, and days from planting to harvest were as follows.

State	Location	Planting Date	Vine Kill Date	Harvest Date	Days to Harvest
California	Kern Co.	2/16	-	6/16	120
"	Tulelake	5/19	9/8	9/28	132
Colorado	San Luis Vly	5/14	9/10	9/18	127
Idaho	Aberdeen	5/5	9/8	9/21	139
"	Kimberly-Early	4/28	7/29	7/31	94
"	Kimberly-Late	4/28	-	10/9	164
New Mexico	Farmington	4/24	9/17	10/1	160
Oregon	Hermiston-Early	3/30	7/23	8/14	137
"	Hermiston-Late	4/10	9/8	9/21	164
"	Malheur	4/29	9/14	9/15	139
Texas	Olton	4/3	7/30	8/11	130
Washington	Othello-Early	4/7	-	8/3	118
"	Othello-Late	4/23	-	9/15	145
"	Prosser (Disease Data Only)				

Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. May and June temperatures were above normal in the northern part of the region while July and August were slightly below normal. The southern areas were mostly normal but Kern Co. was hot at midseason.

Data on vine and tuber characteristics, yield, internal quality, disease reactions, and merit scores are presented in Western Tables 1 through 7. The round red NDTX9-1068-11R had the top score for fresh market; AC80369-1 and C008014-1 scored best for processing with A79141-3 and Lemhi Russet scoring second; the four scored higher than Russet Burbank for processing potential. However, A79141-3 averaged 24% under 4 oz.

<sup>1/</sup>California, R. Voss, K. Brittan; Colorado, D. Holm; Idaho, S. Love, G. Kleinschmidt; New Mexico, E.J. Gregory; Oregon, A. Mosley, D. Hane, C. Stanger, S. James; Texas, D. Smallwood, J. C. Miller; Washington, R. Thornton, W. Iritani, M. Martin.

Western Table 1. 1987 Seed source, stand, tuber and vine characteristics, and foliar diseases.<sup>1/</sup>

Entry	Seed Source	Stand (10 loc)	TUBERS		Vine Size	Maturity	Vert Wilt		E. Blight	
			Shape	Skin			ID	WA	ID	WA
Full Season										
A76147-2	OR	85	O	NRus	MLrg	Med	MS	S	S	-
A7816-14	ID	91	L	Rus	M	ML	MR	S	MS	VS
A7961-1	ID	94	OL	"	MSm	Med	S	VS	S	-
A79141-3	OR	88	L	"	MSm	Med	S	S	S	MS
AC79100-1	OR	85	OL	"	Med	ML	MR	S	VS	MS
AC80369-1	CO	91	L	"	MSm	ML	R	MS	MR	R
Lemhi Russet	OR	89	LO	"	Med	ML	S	-	S	-
Russet Burbank	OR	91	L	"	Med	ML	S	-	S	-
Early										
C008014-1	OR	88	OL	"	MSm	ME	S	VS	S	-
NDTX9-1068-11R	OR	82	RO	Red	Sm	ME	MS	VS	S	MS
Red LaSoda	ID	95	R	Red	Med	ME	MS	-	S	-
Norgold Russet	OR	89	OL	Rus	Sm	E	VS	-	VS	-

1/ M, Med = medium, Lrg = large, Sm = small, ML = medium large; ML = medium late, ME = medium early, E = early; R = resistant, S = susceptible, MR = moderately resistant, MS = moderately susceptible, VS = very susceptible, O = oblong, L = long, R = round, OL = oblong-long; L-O = long-oblong; NRus = non-russet.



Western Table 2. 1987 Total tuber yield, cwt/acre. Full season and early harvests.<sup>1/</sup>

Entry	California		Idaho		NMex		Oregon		Texas		Wash		Overall
	Krn	Tul	SLV	Ab	Kim <sup>2</sup>	Prm	Hrm	Mal	Olt	Spr	Oth	Mean	
A76147-2	480	590	455	593	510 (280)	594	660 (496)	275	637	826	605 (510)	566	
A7816-14	335	560	336	503	539 (264)	603	595 (382)	364	665	461	782 (370)	522	
A7961-1	315	545	331	547	339 (240)	462	480 (392)	274	623	821	854 (555)	508	
A79141-3	265	510	328	509	422 (303)	551	575 (398)	256	643	508	802 (541)	488	
AC79100-1	340	485	427	482	492 (196)	587	469 (245)	385	287	484	781 (431)	474	
AC80369-1	---	450	345	484	458 (191)	---	493 (354)	---	425	604	686 (497)	493	
Lemhi Russet	350	505	343	578	550 (245)	607	621 (382)	341	429	608	692 (502)	511	
Russet Burbank	345	535	356	521	448 (220)	593	530 (439)	291	498	615	809 (449)	504	
COO8014-1	275	550	378	518	481 (269)	591	587 (458)	373	289	590	809 (537)	495	
NDTX9-1068-11R	310	325	389	471	478 (270)	478	721 (450)	468	462	455	819 (583)	489	
Red LaSoda	315	635	383	582	589 (315)	616	611 (529)	361	815	803	804 (600)	592	
Norgold Russet	310	420	351	410	272 (303)	450	372 (356)	330	358	516	798 (482)	417	
Location Means	331	509	369	517	465 (258)	557	560 (407)	338	511	608	770 (505)	503	

<sup>1/</sup> Early harvest values are shown in parentheses ( ), not included in overall mean.

Western Table 3. 1987 U.S. No. 1's, percent of total yield for locations; overall mean, percent and cwt/acre, early harvest in parentheses, not included in entry mean.

Entry	California		Idaho		NMex		Oregon		Texas		Wash		Mean
	Krn	Tul	Ab	Kim	Frm		Hrm	Mal	Olt	Spr	Oth	%	
A76147-2	82	96	91	87 (86)	97		87 (84)	77	81	81	87 (87)		87 494
A7816-14	81	89	85	80 (86)	96		81 (78)	69	73	25	79 (72)		78 405
A7961-1	97	83	89	81 (71)	97		85 (84)	65	53	52	82 (82)		77 393
A79141-3	92	82	85	72 (61)	89		80 (66)	59	30	37	79 (69)		70 342
AC79100-1	74	82	95	85 (77)	92		84 (85)	62	37	53	81 (84)		78 371
AC80369-1	---	90	90	84 (68)	---		87 (83)	---	54	58	69 (86)		76 377
Lemhi Russet	86	80	93	87 (68)	96		85 (88)	74	51	60	85 (85)		81 415
Russet Burbank	71	81	66	77 (53)	93		80 (79)	65	48	36	70 (65)		69 347
C008014-1	91	95	91	87 (73)	95		87 (88)	73	53	63	86 (85)		84 416
NDTX9-1068-11R	87	92	92	86 (69)	94		78 (83)	74	71	80	87 (93)		84 410
Red LaSoda	83	85	91	90 (78)	83		83 (90)	71	69	82	78 (88)		83 489
Norgold Russet	94	95	87	75 (73)	88		81 (85)	68	49	63	84 (81)		79 329
Location Means	85	88	88	83 (72)	94		83 (83)	69	58	59	81 (82)		79 399



Western Table 4. 1987 U.S. No. 1's over 10/12 oz, percent of total yield for locations; overall mean, percent and cwt/acre; early harvest in parentheses, not included in entry mean.

Entry	California		Colo	Idaho		NMex	Oregon		Texas		Wash		Mean
	Krn	Tul	SLV	Ab	Kim	Frm	Hrm	Mal	Olt	Spr	Oth	% cwt/A	
A76147-2	8	58	49	59	53 (22)	63	49 (52)	38	18	13	55 (45)	41	234
A7816-14	9	53	26	34	49 (8)	53	45 (25)	37	15	3	50 (23)	36	190
A7961-1	19	43	32	43	31 (4)	57	38 (40)	27	3	6	54 (41)	32	162
A79141-3	0	36	4	21	12 (2)	7	7 (10)	13	0	1	30 (7)	13	64
AC79100-1	3	48	33	49	40 (4)	45	29 (22)	23	2	2	52 (28)	33	158
AC80369-1	---	40	38	53	39 (4)	---	39 (21)	---	0	4	45 (35)	32	158
Lemhi Russet	4	43	35	37	31 (0)	42	46 (30)	19	1	6	35 (22)	29	148
Russet Burbank	0	19	9	10	8 (3)	21	18 (30)	21	0	0	28 (6)	13	66
C008014-1	11	46	36	20	24 (2)	42	33 (28)	36	0	8	37 (20)	29	143
NDTX9-1068-11R	10	62	26	30	28 (4)	59	44 (32)	34	8	9	46 (38)	34	166
Red LaSoda	16	52	21	27	39 (8)	57	49 (42)	34	8	12	49 (23)	33	198
Norgold Russet	1	42	8	24	3 (3)	28	18 (31)	17	1	3	35 (18)	19	78
Location Means	7	45	27	34	32 (6)	43	36 (32)	28	6	6	43 (26)	29	146

1/ Graded by size: >3"  
2/ Over 10 oz.

Western Table 5. Specific gravity of tubers; early harvest in parentheses,  
not included in entry means.

Entry	California		Colo SLV	Idaho		NMex Frm <sup>1/</sup>	Oregon		Texas		Wash		Overall Mean
	Krn	Tul		Ab	Kim		Hrm	Olt	Spr	Oth			
A76147-2	1.079	1.078	1.092	1.081	1.080 (71)	1.083	1.074 (69)	1.073	1.060	1.070 (81)	1.077		
A7816-14	93	80	91	93	90 (68)	92	81 (73)	80	64	74 (87)	84		
A7961-1	85	86	90	83	88 (73)	90	77 (74)	76	65	74 (82)	81		
A79141-3	93	87	98	87	86 (80)	94	87 (81)	83	81	78 (92)	87		
AC79100-1	---	82	92	84	83 (65)	77	77 (69)	64	64	75 (78)	78		
AC80369-1	---	88	99	94	82 (67)	---	69 (68)	75	66	75 (85)	81		
Lemhi Russet	85	80	94	92	89 (74)	91	83 (79)	76	72	75 (88)	84		
Russet Burbank	85	85	88	84	77 (68)	88	76 (70)	79	75	77 (83)	81		
C008014-1	79	78	90	86	83 (75)	85	80 (74)	72	66	73 (87)	79		
NDTX9-1068-11R	68	70	78	69	70 (65)	76	57 (52)	61	65	57 (73)	67		
Red LaSoda	67	71	83	79	78 (65)	77	63 (61)	64	66	65 (73)	71		
Norgold Russet	75	88	79	73	70 (74)	82	60 (61)	66	62	67 (86)	72		
Location Means	1.081	1.081	1.090	1.084	1.081 (70)	1.085	1.074 (69)	1.072	1.067	1.072 (83)	1.079		

1/ Hydrometer used for specific gravity. The rest used air weight-water weight.

Western Table 6. 1987 External and internal defects, french fry color, sugar ends, glucose, vitamin C, protein and TGA contents.

U.S. No. 2												
Entry	& Culls >4 oz %1/	Common SCAB <sup>2/</sup> (6 loc)	Shatter Bruise 3/	Hollow heart %4/	Black- spot 5/	French Fry Color	Sugar Ends %7/	Glucose YSI (DWB) <sup>8/</sup>	Vit. C Mg/100g Fresh <sup>8/</sup>	Pro- tein % DWB	TGA mg/100g 8/	
A76147-2	7	1.8	1.7	1.4	2.4	2.6	17	0.7	22	4.0	11	
A7816-14	13	1.0	2.1	0.5	2.1	2.6	43	1.1	29	6.3	13	
A7961-1	8	1.0	1.0	1.9	2.1	2.2	41	0.6	19	4.3	3	
A79141-3	6	1.0	2.2	2.1	2.2	1.5	20	0.3	12	5.0	11	
AC79100-1	10	1.0	3.0	6.9	2.3	2.4	24	0.8	26	4.0	5	
AC80369-1	11	1.0	1.8	1.5	3.1	1.5	35	0.3	23	4.0	9	
Lemhi Russet	7	1.1	2.0	3.3	3.3	1.9	20	0.4	24	2.5	9	
Russet Burbank	15	1.1	2.0	2.0	1.7	2.1	27	0.6	17	3.4	11	
CO08014-1	6	1.1	2.3	0.3	1.5	1.5	12	0.3	21	5.2	9	
NDTX9-1068-11R	6	2.7	4.8	1.3	2.1	3.1	52	2.4	14	4.7	7	
Red LaSoda	7	2.5	2.7	4.8	1.6	2.3	25	0.9	21	5.0	8	
Norgold Russet	3	1.0	2.1	8.1	2.0	2.8	19	1.1	26	6.1	4	
Means	8	1.4	2.3	2.8	2.2	2.2	--	0.8	21	4.5	8	

1/ N.Mex omitted.

2/ 1.0 = none, 9.0 = most severe.

3/ 3 loc (Ab, Kim, Hrm), 1.0 (none) to 9.0 (worst).

4/ mean of 6 locations, >10/12 oz.

5/ mean of 5 locations, 1.0 (lightest) to 5.0 (darkest).

6/ Mean of 4 locations (SLV, Ab, Kim, Hrm), out of 453F storage, <1.0 (lightest) to 4.0 (darkest).

7/ Mean of 3 locations.

8/ Aberdeen tubers only.

Western Table 7. Merit scores, fresh market and processing.<sup>1/</sup>

Entry	Merit Score: Fresh Market					Merit Score: Processing				
	California		Idaho		Texas		Oregon		Idaho	
	Krn	Tul	Colo	Kim	Olt	Spr	Oth	SLV	Kim	Means
A76147-2	1	2	1	5.0	2.0	3.0	2.8	4	2.2	3.1
A7816-14	-	4	4	2.8	2.7	4.3	3.6	5	4.2	4.1
A7961-1	2	-	4	1.7	2.7	3.0	2.7	4	3.3	3.8
A79141-3	-	-	5	4.4	3.0	4.3	4.2	4	2.2	2.7
AC79100-1	-	-	1	3.9	4.0	3.3	3.1	4	3.9	4.0
AC80369-1	-	-	3	1.0	3.3	3.0	2.6	1	1.0	1.0
Lemhi Russet	5	-	3	1.0	2.7	3.0	2.9	3	1.0	2.0
Russet Burbank	-	3	4	2.2	4.0	4.3	3.5	3	2.5	3.2
CO08014-1	4	1	1	3.3	3.3	2.7	2.6	1	1.1	1.1
NDTX9-1068-11R	3	-	2	1.1	2.0	2.0	2.0	5	5.0	5.0
Red LaSoda	-	-	2	3.9	2.3	2.3	2.6	5	4.4	4.8
Norgold Russet	-	5	4	4.4	3.0	2.7	3.8	4	4.4	4.5

<sup>1/</sup> 1.0 = Best.

## CALIFORNIA

R.E. Voss, J.T. Smith and K.L. Brittan

### OBJECTIVES

1. Obtain or develop new and/or improved russet, long white, red, and chip processing varieties of higher quality and yield.
  - a. For hot interior valleys, fresh market russet criteria include early maturity, high percent of count-size tubers, heat tolerance, and air pollution resistance.
  - b. For northern mountain valleys, fresh market criteria include storageability; high percent No. 1's; and resistance to leafroll virus, net necrosis, or green peach aphid.
  - c. For chip processing, high solids and low sugar content are essential.
  - d. Red-skinned varieties with early maturity, no internal necrosis, and shallow eyes are desired in all production areas, including those not currently producing reds.
  - e. Long whites with high percent No. 1's, good transit and shelf-life quality.
2. Grow selected varieties, advanced selections and seedlings to determine if they possess desirable characteristics sought by growers and consumers.

### SUMMARY OF RESULTS

Replicated yield trials were conducted at five locations. A total of 41 russets, 24 chippers, 5 long whites, and 7 reds were grown at one or more of these locations. Observational trials of varying size (27-hill, 12-hill, 5-hill, single hill) were grown near Tulalake and in Kern County. Increased emphasis was placed on red-skinned varieties for the future. Selections for further evaluation from the observational trials included 80 russets, 35 chippers, 6 long whites, and 25 reds.

Parents with the most progeny selected in the first year and observational plots included A74133-1, A76260-16, A7946-10, A68113-4, TND 329-1, Russet Norkotah, Ute, Chieftain, Red La Soda, A7816-14, ND1196-2R and Lemhi.

Additionally, Western Regional trials were conducted in Kern County and Tulalake. A national uniform trial of chipping selections, sponsored by the Snack Food Association, was conducted in Kern County. A cooperative trial was conducted with Anheuser Busch/Eagle Snacks.

Recently-released, newly-named varieties with increasing commercial interest include Russet Norkotah (ND534-4), Sierra (AD7377-1), Russet Nugget (TC582-1), Hilite (LC1), Coastal (B9596-1) and Krantz.



The most promising advanced selections that have been tested in California and with the best results in 1987 include:

<u>Russets</u>	<u>Chippers</u>	<u>Long Whites</u>	<u>Reds</u>
A74133-1	NY81	A76147-2	NDTX9-1068-11R
C008014-1	AC80545-1	BC0038-1	NDTX8-731-1R
A7816-14	NY72		
A7411-2	MS700-83		
CD80132-1			
ND534-4			

Table 1 summarizes data from the five replicated yield trials. The Kern County trial included 23 russets, 17 chipping clones, 4 long whites and 4 reds; the Tulalake trial included 29 russets, 11 chipping clones, 2 long whites and 2 reds; the Santa Maria coastal trial included 12 russets and 2 reds; the Humboldt County north coast trial included 9 chipping clones, 2 russets and 3 reds; and the Riverside trial included 6 russets, 5 chipping clones and 3 long whites. Yields in Kern County were below normal (300 cwt/A average), but a few clones produced good yields and quality despite the poor conditions. Highest yields were produced by A80615-2, A7961-1, Lemhi, NY81, NY72, AD80481-5, Atlantic, AC80545-1, A76147-2, NDTX9-1068-11R and Red La Soda. Highest quality ratings were from ND534-4, A7961-1, AC80545-1, NY72, NY71, D195-11, MS700-83, BC0038-1, NDTX9-1068-11R, and NDTX8-731-1R.

Growing conditions at Tulalake were generally good, with yields ranging from 710 to 140 cwt/A (470 cwt/A average total yield). Highest yielding clones were A80570-4, C008014-1, A7816-14, AD79341-7, A7961-1, A7411-2, AC80545-1, NDD2007-1, Shepody, Rosa, A76147-2 and Red La Soda. Highest quality were clones Norgold Russet, Russet Burbank, CD80132-1, C008014-1, A74133-1, AC80545-1, Shepody, A76147-2, and NDTX9-1068-11R. Black spot susceptibility was evaluated; the most susceptible clones were Lemhi, NDD800-3, AC80369-1, Shepody, AD77187-7, Kennebec, NDD1784-5 and Red La Soda. Clones with low susceptibility to black spot were NDD2207-17, A74114-4, AD7430-1, AD81323-5, AD79491-1 and NDD2007-1. Storageability was also evaluated, and a combined rating based on sprouting, turgidity and disease were recorded. Clones with the best storageability were A74114-4, A74133-1, A7816-14, AD81323-5, ND534-4, NDD2207-17, Russet Burbank, AD79491-1, COA7919-4, and B15. The red selection NDTX9-1068-11R stored very poorly.

Yields at Santa Maria were good (455 cwt/A average), and quality varied. The highest yielding clone was Sierra, followed by A80570-4, A7411-2, A74133-1 and Chieftain. Sierra also had the highest quality rating, followed by A80570-4, AD7430-1, A74212-1 and Chieftain. Hollow heart conditions were prevalent, thus a good test for susceptibility was achieved.

Humboldt County growing conditions were also generally good (470 cwt/A average total yield), but scab infestation was severe. Thus a good test for scab susceptibility in this area was obtained. Highest yielding clones were Kennebec, as usual, followed by AD77187-7, Rosa, A79543-2R, Chieftain, Calgold and Sierra. The lightest color chips were produced from Rosa, AC80545-1 and COA7919-4; the highest specific gravity clones were COA7919-4, AD77187-12 and NDD1784-5. Nearly all of the chipping clones were highly infected by common scab, with Rosa, Kennebec and NDD1784-5 the most severe; AD77187-12 was the only one with slight infection. Neither Calgold nor Sierra were highly infected; similarly, Chieftain and New Norland were only slightly infected.

The Riverside County trial produced generally low yields (245 cwt/A average). The highest yielding clones were ND534-4, MS700-83, Kennebec and A76147-2. Highest quality ratings were produced by ND534-4, Sierra, MS700-83, Rosa, Kennebec and A76147-2.

Table 2 lists the selections made from the non-replicated, observational plots at Kern County and Tulalake. In the Kern County 27-hill trial, 14 russets, 8 chippers, 3 reds and 3 long whites were selected; at Tulalake, 15 russets, 3 chippers, 2 reds, 1 long white and 1 other white were selected. In the Kern County 12-hill trial, 10 russets, 1 chipper and 1 red were selected; at Tulalake, 15 russets, 3 chippers, 1 other white and 9 reds were selected. In the Kern County 5-hill trial, 17 russets, 3 reds and 4 whites were selected; at Tulalake, 7 russets, 1 red, and 4 whites were selected.



CALIFORNIA TABLE 1. 1987 Potato Variety Trials

Summary of Yield, Quality and Characteristics of Standard and Potential Varieties

Clone	Location	Yield, cwt/A				2's & Culls	B's	% 1's	S.G.	Tuber <sup>2/</sup> Black <sup>3/</sup>		Storage <sup>4/</sup>	Notes <sup>5/</sup>
		No. 1's								Rating	Spot		
		Total	>10oz	4-10oz									
RUSSETS													
A7411-2	K, T, SM	480	380	135	245	75	25	80	86	3.1	1.2	Good	
A74114-4	T	260	210	100	110	25	25	81	82	3.3	0.5	Exc	S1 HH
A74133-1	T, SM	480	400	140	260	40	40	83	80	3.4	2.5	Exc	SK
A74212-1	SM	370	295	160	135	30	40	80		3.4			S1 HH
A76260-16	T	360	290	180	105	55	20	80	74	3.3	2.0	Good	Mod HH
A7816-14	K, T	450	385	160	220	50	10	85	86	3.4	1.5	Exc	S1 HH
A7955-2	K	260	160	15	145	80	20	62	81	2.8			
A7961-1	K, T	420	380	145	35	35	15	89	86	3.4	1.8	Poor	S1 HH
A79108-3	T, SM	420	315	185	130	90	20	73	80	2.6	1.5	Good	Mod HH, GC
A79141-3	K, T	390	330	90	240	30	20	87	90	3.2	2.2	Fair	S1 HH, GC
A79142-1	K	245	210	15	195	30	5	86	85	3.4			Mod HH
A80570-4	T, SM	560	470	180	290	50	40	84	78	3.2	2.0	Poor	S1 HH
A80615-2	K	410	355	20	335	45	10	87	75	3.1			SC
AC79100-1	K, T	410	325	120	200	70	10	78	82	3.2	2.2	Poor	Mod HH, GC
AC79128-1	K	350	265	40	225	70	15	76	78	3.3			GC
AC80369-1	T	450	400	180	225	25	20	89	88	3.4	4.0	Poor	S1 HH, GC
AD7430-1	T, SM	460	370	140	230	40	50	80	76	3.0	0.5	Fair	S1 HH
AD7818-5	K, T, SM, R	380	290	75	210	60	25	74	79	2.9	2.5	Fair	KN, SC
AD79341-7	T	540	455	205	250	60	20	84	76	3.2	2.0	Good	S1 HH
AD80472-1	K	305	240	35	205	55	10	79	87	3.0			SC
AD81323-2	T	345	295	170	125	30	20	83	84	3.2	1.0	Good	
AD81323-5	T	280	235	70	160	25	20	79	80	2.6	0.8	Exc.	S1 HH
AD81324-4	T	145	65	35	30	70	5	46	82	1.9	2.8	Good	Mod HH, Sev GC
CD80132-1	T	495	415	170	245	60	15	84	84	3.6	1.8	Fair	Rot
CO8011-5	K	160	145	5	140	10	5	91	65	3.3			
CO08014-1	K, T	410	385	140	240	20	20	92	78	3.6	2.8		S1 HH

CALIFORNIA TABLE 1, continued

Clone	Location <sup>1/</sup>	Yield, cwt/A				S.G.	Tuber <sup>2/</sup> Rating	Black <sup>3/</sup> Spot	Storage <sup>4/</sup>	Notes <sup>5/</sup>
		No. 1's		2's &						
		Total	Total	>10oz	4-10oz					
RUSSETS, continued										
ND435-12	K	240	225	5	220	10	5	94	79	3.6
ND534-4	K, T	320	285	90	190	20	15	90	72	3.8
NDA848-3	K	305	260	25	235	35	10	85	78	3.4
NDD800-3	T	460	350	110	245	65	45	76	83	3.3
NDD837-2	T	340	290	140	150	35	15	86	74	3.0
NDD1258-1	K	190	165	30	135	15	10	87	68	2.9
NDD1965-3	K, T, SM, R	220	175	30	140	20	25	80	78	2.9
NDD2061-3	T	140	95	30	65	25	20	68	78	2.8
NDD2207-17	T	325	265	150	110	45	15	81	70	3.0
TC582-1	K	160	150	-0-	150	-0-	10	94	89	3.4
Calgold	SM, H, R	365	305	130	175	40	20	83	70	3.2
Centennial	K	180	165	15	150	10	5	92	74	3.2
Lemhi	K, T	430	350	115	235	60	15	82	82	3.6
Norgold Rus	K, T, R	320	290	160	230	15	10	91	88	3.2
Rus. Burbank	K, T, SM	450	335	75	260	80	35	74	88	2.9
Sierra	H, SM, R	400	355	60	295	20	30	91	88	3.4
CHIPPERS										
AB1 (Michigold)	K	210	205	-0-	205	-0-	5	98	85	2.6
AC80545-1	K, T, H	550	465	155	310	70	10	84	84	3.5
AD77187-7	K, T, H, R	345	320	100	220	15	15	89	85	3.5
AD77187-12	K, T, H, R	380	295	85	210	70	15	78	90	3.4
AD79240-6	K	310	265	5	260	40	5	85	86	2.8
AD80481-5	K	405	380	10	370	15	10	94	79	3.7
AD79491-1	T	430	410	130	275	15	10	94	76	3.9
BR7093-24	T, K	460	430	130	295	20	10	92	82	3.8
COA7919-4	K, T	390	365	140	220	20	10	92	88	3.9
D195-11	K	235	225	-0-	225	-0-	10	96	85	4.0

CALIFORNIA TABLE 1, continued

Clone	Location	Yield, cwt/A				2's &		B's	% 1's	S.G.	Tuber <sup>2/</sup> Black <sup>3/</sup>		Storage <sup>4/</sup>	Notes <sup>5/</sup>
		1/Total	No. 1's Total	>10oz	4-10oz	Cull's	Rating				Spot			
CHIPPERS, continued														
MS700-83	K,H	400	350	90	255	30	89	80	3.8					Mod SC, Mod GC
NDD1784-5	T,H	440	320	85	230	105	71	88	2.7		3.2	Poor		Sev HH, Sev SC, Sev GC
NDD12007-1	T	620	570	205	360	40	91	78	3.7		0.8	Fair		Mod HH Mod SC
NY71	K	305	300	5	295	-0-	98	74	3.7					
NY72	K	405	385	15	370	15	95	88	4.2					
NY81	K	520	495	55	440	20	95	85	4.1					
NY82	K	260	245	15	230	5	94	78	3.5					
Atlantic	K	385	375	20	355	5	97	90	3.9					S1 HH
Kennebec	K,T,H,R	500	405	200	200	90	82	84	3.3		3.2	Poor		Mod HH, Sev SC
Norchip	K	280	260	5	255	15	93	83	3.7					
Rosa	T,R,H	460	415	115	300	20	91	82	3.8		3.0	Poor		Mod HH, Sev SC
SH1 (Shepody)	T	740	650	445	205	80	87	78	4.0		3.5	Poor		Mod HH, Mod SC
Shepody	H	320	275	120	155	35	85	90	3.3					
LONG WHITES														
A76147-2	K,T,R	445	405	140	265	35	91	78	3.9		1.5			S1 HH, S1 SC
AD74548-5	R	285	230	-0-	230	25	80		3.1					
B15	T	480	430	230	200	45	88	90	3.0		2.5	Exc		S1 HH
BC0038-1	K	225	210	30	215	5	93	80	4.2					S1 HH
White Rose	K,R	310	210	15	200	80	72	68	2.4					GC

CALIFORNIA TABLE 1, continued

Clone	Location <sup>1/</sup>	Yield, cwt/A				2's &		% 1's	S.G.	Tuber <sup>2/</sup> Black <sup>3/</sup>		Notes <sup>5/</sup>
		No. 1's		Culls		Rating	Spot					
		Total	>10oz	4-10oz	Culls							
ARDS												
A79543-2R	H	530	495	75	420	10	25	93	80	4.1		Mod SC
NDA1550-1R	K, SM	260	230	40	185	10	20	90	70	3.4		S1 HH, S1 SC
NDTX8-731-1R	K	165	155	5	150	-0-	10	94	75	4.2		S1 SC
NDTX9-1068-11R	K, T	320	285	115	170	10	20	88	69	4.2	1.5	S1 SC S1 HH, V Poor
Chieftain	H, R	440	370	130	240	40	30	84	84	3.8		S1 SC Mod IN
New Norland	H	450	390	165	220	45	15	87	80	3.6		GC
Red La Soda	K, T	475	400	190	210	70	10	84	69	2.4	3.2	Mod HH Poor

1/

Locations: H = Humboldt County, K = Kern County, R = Riverside County, SM = Santa Maria, T = Tularelake

2/

Tuber Rating: 1 = low, 5 = high, 3 = minimum acceptable visual rating

3/

Black Spot: 0 = none, 5 = most severe susceptibility

4/

Storage: subjective rating based on sprouting, turgidity, and rot

5/

Notes: S1 = slight, Mod = moderate, Sev = severe, V = very

GC = growth cracks, HH = hollow heart, IN = internal necrosis, KN = knobs &amp; second growths, SC = scab,

SK = skinned

CALIFORNIA TABLE 2. 1987 Potato Variety Trials  
Selections from Non-Replicated Observational Plots

RUSSETS

<u>Clone</u>	<u>Location</u>	<u>Clone</u>	<u>Location</u>
AB0445-6	T12	AD83071-1	K12, T12
AB0570-4	K27	AD83210-1	K12
AB2705-1	K27	AD83241-2	T12
AC77226-10	K27, T27	AD83241-3	T12
AC77513-1	K27	AD8407-1	T5
AC77652-1	T27	AD8408-1	K5
AC7869-17	K27, T27	AD8409-1	K5
AC8024-5	T27	AD8410-1	T5
AC8024-5K	T27	AD8412-3	K5
AC80369-1	K27, K12	AD8487-4	T5
AC81198-11	K27	AD84146-1	T5
AD81512-2	K27	AD84274-2	K5
AD81560-3	K12	AD84274-3	K5
AD81681-14	T27	AD84275-4	K5
AD81768-8	T27	AD84276-1	K5
AD81770-7	T27	AD84279-3	K5
AD82130-4	T27	AD84280-3	K5
AD82276-1	K5	AD84496-1	T5
AD82276-4	K5	AD84496-2	K5
AD82276-6	K5	AD84496-5	K5, T5
AD82280-2	K5	AD84496-6	T5
AD82283-2	K5	AND77230-1	T27
AD82286-1	T5	BC0169-12	K27
AD82287-2	K5	BC0224-13	T27
AD82287-3	K5	C07916-3	K27
AD82482-10	K5	C07918-15	K27, T27
AD82485-1	T5	C08190-1	K27, T27
AD82486-1	T5	ND435-12	T27
AD83020-1	K12	NDD1099-3	T12
AD83022-1	K12	NDD1842-3	K27
AD83032-1	T12	NDD2346-3	T27
AD83032-4	K12	NDD2405-3	K12
AD83034-5	T12	NDD2563-7	T12
AD83040-6	T12	NDD2615-1	K12
AD83040-14	T12	NDD2667-1	K12
AD83052-3	K12	TND329-1	K27

CALIFORNIA TABLE 2, continued

CHIPPERS, WHITES

<u>Clone</u>	<u>Location</u>
AC77513-1W	K27
AC80545-1	K27
AD77187-7	K27
AD81738-12	T27
AD81739-9	T27
AD8487-1	T5
AD8492-5	T5
AD84103-3	T5
B15	K27
B47	K27
B141	K27
BC0038-1	K27
BR7093-24	K27
MS700-83	T27
NDA1411-4	T27
NDD277-2	K27
NDD986-13	K27
NDD1784-5	K27
NDD1821-5	K27
NDD2383-2	K12
NDD2471-2	T12
85SD7-5	T12
85SD41-5	K5
86SD8-2	T5
86SD8-5	K5
86SD39-1	K5
86SD127-1	K5

REDS

<u>Clone</u>	<u>Location</u>
A79543-2R	T27
A82745-1R	T12
A82583-2R	K27
A82583-3R	K27
A83303-13R	T12
A83357-7R	T12
A83359-5R	T12
A83359-7R	T12
A83364-7R	T12
A83365-2R	T12
AD83365-4R	K5
AD83365-7R	T5
AD83365-8R	K5
AD83365-9R	K5
NDD2441-4R	T12
NDD2519-5R	T12
NDD2566-7R	K12
UC142-1R	T27



## COLORADO

D. G. Holm

### Breeding Program

Characteristics being emphasized in the Colorado program are yield, specific gravity, russeting, and fresh market/processing qualities.

Thirty parental clones were intercrossed in 1987. Seeds from 155 combinations were obtained. Sixty seedling families were grown in the greenhouse, producing 6,088 tubers for initial selection in 1988. Surplus tubers were distributed to Idaho, Oregon and Texas.

Seedling tubers were obtained from Dr. J. J. Pavek, Aberdeen, Idaho, and Dr. J. Creighton Miller, Lubbock, Texas.

### Selection Program

A total of 36,359 first-year seedlings were planted, with 357 being selected for further observation. Another 562 clones were in various stages of preliminary and intermediate testing. One hundred twenty-two of these clones were saved for further evaluation. Twenty-three advanced selections (18 russets, 4 chippers, and 1 long white) were saved and will be increased. Another 75 clones were maintained for breeding and other experimental purposes.

Advanced Yield Trial. Twenty-four clones (21 advanced selections and three cultivars) were evaluated in the advanced yield trial. Results for yield, grade, and other characteristics are summarized in Table 1.

Eight selections had greater total and US #1 yields than Russet Burbank. Of these, three are in final stages of seed increase prior to releasing to growers in 1989 for evaluation. These selections are: AC77101-1, BC0038-1, and CO8011-5. BC0038-1 is a long white with processing potential. AC77101-1 and CO8011-5 are both fresh market russets. These clones will be entered into the 1988 Western Regional Trials.

Chipping Studies. Twelve selections and two cultivars were evaluated for chipping potential at harvest and after various storage regimes. Specific gravity was determined at harvest. This data is presented in Table 2.

None of the selections produced acceptable chips after storage at 40° F or with reconditioning out of 40° F storage. Clones producing acceptable chips out of the field and after most other storage regimes were: A80503-1, A80559-2, AC80545-1, BR7093-24, CO81103-1, NDA1725-1, W842, Atlantic and Norchip.

Borden, Inc. cooperated in testing many materials in our program for chipping potential. Results are summarized in Table 3.



Clones with color better than Norchip were: AB0559-2, AC80369-1, AC80545-1, BR7993-24, and W842. AC80369-1 has a russeted skin.

Grower Tests. AC79100-1 was tested by growers for the first time in 1987. It will be retested in 1988. TC582-1 was tested for the third year.

Data collected on the performance of AC79100-1 and TC582-1 is summarized in Table 4. Both of these selections have a greater total and US #1 yield potential than Centennial Russet. Percent US #1 yield and specific gravity gravities are greater than Centennial Russet and Russet Burbank.

Seed of three Sangre line selections (10, 11 and 14) were released to growers for planting in 1987. Grower response was very positive.

A chipper, AC80545-1, will be released for initial grower testing in 1988.

Cultivar Release. Based on grower response and overall performance, TC582-1 will be named in 1988. The name selected for TC582-1 is Russet Nugget because the tubers have a high solids content and the flesh is a light golden color with a high concentration of vitamin C and protein. Russet Nugget is a dual purpose potato because of its fresh market and processing qualities.

Colorado Table 1. Yield, grade, stand, vine maturity, specific gravity, stem number per plant and tuber shape and skin type for advanced yield trial clones - 1987.

Clone	Yield (Cwt/A)				% Stand	Vine Maturity <sup>1</sup>	Specific Gravity	Stems/Plant	Tuber Shape <sup>2</sup> & Skin Type
	Total	US #1		<4 oz					
		Total	%						
AC77101-1	428	379	88.6	101	96	2.0	1.080	3.2	L, R
AC77226-10	268	243	90.6	85	88	3.8	1.067	2.8	L, R
AC77226-13	309	277	89.6	100	90	3.5	1.069	3.8	L, R
AC77513-1	325	272	83.6	74	84	3.2	1.078	2.6	L, R
AC77652-1	298	240	80.3	39	93	3.0	1.071	4.6	Ob, R
AC7869-17	339	305	89.6	138	98	3.2	1.076	3.3	Ob, R
AC8024-5	527	440	83.4	128	99	3.2	1.085	3.9	Ob, R
AC81198-11	428	360	84.3	181	98	3.0	1.070	2.9	Ob, R
BC0038-1	411	327	79.9	86	97	3.2	1.085	4.2	L, W
BC0169-12	404	363	90.1	150	95	3.0	1.074	3.2	Ob, R
BC0224-3	365	291	79.8	41	97	3.0	1.087	4.2	L, R
CO7918-11	375	330	88.0	109	94	3.8	1.075	2.1	Ob, R
CO8011-5	401	366	91.4	90	97	3.0	1.070	2.8	Ob, R
CO8138-6	339	291	85.9	83	98	2.2	1.079	4.5	L, R
CO8182-1	308	272	88.4	71	94	2.0	1.079	3.0	L, R
CO8190-1	418	377	90.1	86	98	2.2	1.078	3.4	Ob, R
CO8195-4	333	286	86.0	70	100	2.5	1.091	3.6	Ob, R
MN10874	380	328	86.3	60	99	3.0	1.089	3.3	Ob, R
NDTX9-1069-4RU	374	328	87.8	136	100	1.5	-----	2.5	Ob, R
TC582-1	328	270	81.8	57	96	4.0	1.089	2.8	Ob, R
WNC567-1	343	298	87.0	90	95	3.2	1.076	2.5	L, R
Centennial Russet	297	246	82.9	49	91	3.2	1.086	2.6	Ob, R
Russet Burbank	375	269	71.6	52	98	2.2	1.089	3.4	L, R
White Rose	499	410	82.3	157	99	2.2	1.083	3.2	L, W
Mean	370	315	85.4	93	96	2.9	1.079	3.3	---
LSD (0.05)	43	43	5.7	38	7	0.5	-----	0.6	----

<sup>1</sup>Vine Maturity is rated on the following basis: 1 = very early; 2 = early; 3 = medium; 4 = late; and 5 = very late.

<sup>2</sup>Tuber shape: Ob = oblong; L = long  
Skin type: R = russet; W = white

Colorado Table 2. Chip color<sup>1</sup> and specific gravity of San Luis Valley chipping study entries - 1987.

Clone	At Harvest	3 wks 70° F	10 wks 40° F	10 wks 50° F	Reconditioned		Specific Gravity
					10 wks/40° F	3 wks/60° F	
A80503-1	2.5	1.0	4.5	1.5	3.0	1.5	1.097
A80559-2	2.0	2.5	4.5	2.5	3.5	4.0	1.095
AC80545-1	2.0	2.0	5.0	3.0	4.0	2.5	1.073
AC81592-1	3.0	2.0	5.0	2.5	4.5	2.5	1.085
BR7093-24	1.0	1.0	5.0	3.0	4.5	2.0	1.082
CO81103-1	2.5	2.5	5.0	2.0	3.0	3.0	1.087
CO8286-1	3.0	2.0	5.0	3.5	4.0	2.5	1.087
MN12823	2.5	3.0	4.5	3.0	4.0	2.5	1.079
NDA1725-1	2.0	2.0	4.0	3.0	3.5	1.0	1.084
W842	1.0	1.5	4.5	1.5	3.0	1.0	1.098
WNC521-12	3.0	3.5	5.0	4.0	5.0	3.5	1.095
WNC672-2	3.5	3.0	5.0	2.5	4.0	2.5	1.088
Atlantic	2.0	2.5	5.0	4.0	4.0	2.0	1.093
Norchip	2.5	1.5	5.0	2.0	4.5	1.5	1.082

<sup>1</sup> Chip color was rated using the Potato Chip/Snack Food Association 1-5 scale. Ratings of 2.5 or less are acceptable.

Colorado Table 3. Chip color evaluations by Borden, Inc.<sup>1</sup> - 1987.

Clone	Specific Gravity	Color <sup>2</sup>		
		Sept. 7 <sup>3</sup>	Jan. 28 <sup>4</sup>	Apr. 19 <sup>4</sup>
W842	1.097	2.0	1.5	1.0
AC80369-1	1.085	1.5	2.0	1.5
BR7093-24	1.084	1.5	2.5	1.5
A80559-2	1.097	2.5	2.0	1.5
AC80545-1	1.077	2.0	2.5	1.5
Norchip	1.079	2.5	2.5	2.0
NDA1725-1	1.085	2.0	3.0	6.0
AC81592-2	1.088	3.5	2.5	3.0
CO81103-1	1.088	2.0	4.0	4.5
AC83306-1	1.083	3.5	3.0	2.0
AC83305-2	1.074	3.0	3.5	3.5
A80503-1	1.098	3.0	4.0	3.5
CO8286-1	1.087	3.5	4.0	3.5
Atlantic	1.096	3.0	5.5	4.0
CO83122-1	1.090	4.0	5.0	7.0
AC83250-1	1.072	4.5	5.0	5.0
MN12823	1.078	4.0	6.0	6.0
CO8398-1	1.093	5.0	7.0	6.0
CO8343-1	1.079	7.0	---	---

<sup>1</sup>Data collected by Mr. Larry Anderson.

<sup>2</sup>Color was rated using the PCII 1-10 scale. Ratings of 1-4 acceptable, 5 marginal.

<sup>3</sup>Potatoes were harvested September 1.

<sup>4</sup>Stored at 60-70° F until October 1, then gradually cooled to 48-50° F by November 1.

Colorado Table 4. Comparison of advanced numbered selections with Centennial Russet and Russet Burbank for yield, grade, specific gravity, maturity and grade defects.

Clone	No. of Tests	Yield (Cwt/A)		% US #1	Specific Gravity	Vine Maturity <sup>1</sup>	% External Defects <sup>2</sup>		% Hollow Heart <sup>3</sup>
		Total	US #1				1	2	
AC79100-1	3	389	329	84.4	1.094	3.7	4.0		0.3
TC582-1	5	346	269	78.0	1.101	4.0	2.3		0.4
Centennial Russet	10	279	217	76.7	1.087	3.1	1.6		0.7
Russet Burbank	11	355	233	65.1	1.089	2.7	9.3		1.3

<sup>1</sup>Vine maturity: 1 = Very Early; 2 = Early; 3 = Medium; 4 = Late; 5 = Very Late.

<sup>2</sup>Includes defects such as growth crack, second growth, misshapen, and alligator hide.

<sup>3</sup>Based on tubers greater than 10 ounces.

## Maine

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Introduction: Thirty-eight potato varieties and clones were tested at Aroostook Farm, Presque Isle, Maine during the 1987 growing season. This test was conducted as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast).

Methods: Single-row plots, 25 feet long were planted on May 20 using a randomized complete block design and six replications. Plots were located on a Caribou gravelly loam soil of pH 5.0. The experimental site was cropped to oats underseeded with clover and timothy during 1985 and the clover/timothy mix was allowed to grow through the 1986 growing season prior to fall plowing. Fertilization for the 1987 potato crop consisted of 1000 lbs/A of 14-14-14, banded at planting. Cultural practices were similar to those used on commercial farms in the area and varieties were grouped so that separate tests could be vinekilled and harvested based on maturity classification. Specific gravity was determined at harvest using the weight in air, weight in water method. Hollow heart ratings indicate the number of hollow tubers observed per 60 large tubers examined. Chip color evaluations were conducted during early December following storage at 50° F. Chips were fried at 350° F until bubbling stopped and evaluated based on Potato Chip Institute color chart 1206-u.

Results: Potatoes experienced severe water stress at Aroostook Farm during the 1987 growing season. Only 2.8 and 1.8 inches of rain fell during the months of July and August, respectively. As result, external tuber defects were prevalent in several varieties and specific gravities were generally quite high. AF522-5, A72685-2, and NY76 exhibited moderate to severe leaf chlorosis following application of metribuzin for weed control. AF686-3, AF474-2, AF909-8, Shepody, NY81 and A7411-2 were slightly injured by this herbicide. Within the early test, CS7639-1 and CS7697-24 continue to look promising for early table use (Maine Table 1). NY79 may prove valuable as a dual purpose variety for tablestock and chipping. Yields of NY79 have been acceptable, tubers are generally large and attractive, and chip colors have been acceptable for the past two seasons (Maine Tables 1 and 2).



The most promising tablestock selections in our medium maturity trial were AF909-8 and Donna. Yield and tuber appearance of the former were particularly outstanding (Maine Tables 3 and 4). Donna has been very high yielding in three years of Presque Isle testing; however, scab susceptibility, short dormancy, and occasional rough appearance have been drawbacks at other locations. AF875-16, B9340-13, B9792-61, and B9792-157 show promise as potential chipping varieties.

In the late maturity trial, CS7635-4, NY71, and NY72 continued to perform better than standard late table varieties, namely Katahdin and Ontario (Maine Tables 5 and 6). Despite very good yields and tuber appearance, small tuber size in NY76 remains a problem for tablestock use. Percent growth cracks were very high in Ontario. Chip colors were quite good for NY71 and NY76; however, the former is probably too late in maturity for consistent chip production under northern Maine conditions. AF522-1 was the highest yielding russeted selection in this trial; however, tuber appearance of this clone is generally not acceptable and very early sprouting has been a problem. AF465-2 and AF522-5 performed slightly better than BelRus in this trial; however, small tuber size has and continues to be a major problem in the former clone.

Uneven growing condition caused extensive second growth problems for Russet Burbank in our russet/long trial and as a result marketable yields of this standard variety were very low (Maine Tables 7 and 8). All test clones outperformed Russet Burbank in this test during 1987. Particularly outstanding were NemaRus and A72685-2. Very late maturity is a serious drawback for the latter.

Limited data on storage and processing characteristics were collected from 39 varieties and clones grown during the 1986 growing season (Maine Table 10). None of the clones produced acceptable potato chips from 38° F storage and none were successfully reconditioned from storage at this temperature. After cooking darkening scores were poorer than Katahdin for 22 selections and the following clones were rated particularly poor in this characteristic: Russet Burbank, Russet Norkotah, A7411-2, A72685-2, A76147-2, AF465-2, AF522-1, B9569-2, CS7635-4, NY72, and NY81. Washed appearance ratings were particularly outstanding for Katahdin, AF474-2, AF522-5, F70021, and NY76. Tuber dormancy was exceptionally short for Donna, AF522-1, CF7750-1, and F70021. Selections with the lowest storage weight loss were Russet Burbank, Kennebec, Shepody, A72685-2, A75188-3, AF522-5, NY72, and WF591-1R.



**Maine Table 1.** Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for early varieties grown at Presque Isle, Maine - 1987.

Variety	Total Yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class <sup>1</sup> (%)						Size Distribution (%)			
			cwt/A	1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.	Spec. Grav.
Early Test - 99 days												
Superior (std)	296	100	277	4	18	34	40	4	0	96	44	94
Norchip	274	80	223	11	35	27	25	2	0	89	27	89
AF686-3	272	82	228	13	43	28	15	1	0	87	16	83
B9569-2	248	87	240	47	46	6	1	0	-	7% over 8 oz.		88
CS7639-1	325	108	300	3	12	17	52	14	2	95	66	82
CS7697-24	320	104	287	6	19	25	43	7	0	94	50	90
F70021	280	87	240	6	19	25	41	8	1	93	49	75
ND860-1	228	65	181	18	43	26	13	0	0	82	13	91
NY79	293	98	271	3	14	22	53	8	0	97	61	83
Waller Duncan												
LSD (K=100)	24		24									6

<sup>1</sup>Size classes for all varieties except B9569-2: 1 = 1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4". B9569-2: 1=0 to 4 oz.; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5=over 16 oz.

Maine Table 2. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color for early varieties grown at Presque Isle, Maine - 1987.

Variety	Plant Data <sup>1</sup>		Tuber Data <sup>1</sup>		Tuber Defects (%)			Hollow Heart Rating	Chip Color <sup>2</sup>
	Size 7-20	Matur. at Vinekill	Shape	Appearance	Total	Sun-burn	Mis-shapen		
Early Test-99 days									
Superior (std)	6	3	3	5	2.8	0.3	2.3	0.2	6.6
Norchip	5	4	3	4	8.4	2.2	4.8	1.4	6.5
AF686-3	6	3	3	5	3.2	0.7	2.4	0.1	5.7
B9569-2	5	3	7	7	2.9	0.5	2.4	0.0	8.8
CS7639-1	6	5	3	6	3.1	1.4	1.4	0.3	9.3
CS7697-24	8	6	4	7	4.6	3.7	0.2	0.7	7.5
F70021	7	3	4	6	8.2	5.8	1.3	1.1	8.6
ND860-2	7	3	2	5	3.3	2.1	1.0	0.2	4.3
NY79	6	4	1	7	4.1	4.0	0.0	0.1	5.2

<sup>1</sup> See standard NR-107 rating system for key to codes.

<sup>2</sup> Chip color: 1-7 acceptable, >7 unacceptable; Waller Duncan LSD (K=100)=0.4.

Maine Table 3. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for medium varieties grown at Presque Isle, Maine - 1987.

Variety	Total Yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class (%)						Size Distribution (%)		Spec. Grav.
			1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.	
Medium Test - 107 days											
Kennebec (std)	310	261	2	8	14	48	25	3	95	73	87
Atlantic	298	266	6	24	27	35	8	0	94	43	106
Donna	337	285	6	22	30	38	4	0	94	42	92
Superior	291	271	3	17	28	48	4	0	97	52	91
AF474-2	241	218	5	19	26	44	6	0	95	50	92
AF875-16	256	227	9	34	35	21	1	0	91	22	107
AF909-8	341	314	4	18	27	43	7	1	95	51	85
B9340-13	281	244	6	27	30	35	2	0	94	37	92
B9792-61	264	248	4	18	26	47	5	0	96	52	97
B9792-157	264	233	8	28	30	31	3	0	92	34	102
Waller Duncan											
LSD (K=100)	30	29									4

Size classes: 1 = 1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4".

Maine Table 4. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color for medium varieties grown at Presque Isle, Maine - 1987.

Variety	Plant Data <sup>1</sup>		Tuber Data <sup>1</sup>		Tuber Defects (%)				Hollow Heart Rating	Chip 2 Color
	Size 7-20	Matur. at Vinekill	Shape	Appear-ance	Total	Sun- burn		Growth cracks		
						mis-	shapen			
Medium Test-107 Days										
Kennebec (std)	8	6	5	4	11.0	3.8	5.3	1.9	0	6.8
Atlantic	7	5	1	7	5.0	2.7	1.8	0.5	0	5.5
Donna	7	3	5	5	9.5	4.1	4.5	0.9	0	8.8
Superior	7	2	2	6	3.9	0.9	2.6	0.4	0	6.9
AF474-2	7	5	3	6	5.1	0.7	3.1	1.3	0	8.0
AF875-16	6	5	1	5	2.2	1.0	0.8	0.4	0	5.3
AF909-8	7	3	1	8	3.8	1.1	0.7	2.0	0	7.0
B9340-13	6	2	1	7	7.5	3.2	3.3	1.0	0	5.9
B9792-61	6	3	1	6	2.2	1.1	0.9	0.2	1	5.3
B9792-157	6	5	1	4	3.6	1.6	1.9	0.1	0	5.7

<sup>1</sup>See standard NE-107 rating system for key to codes.

<sup>2</sup>Chip color: 1-7 acceptable, >7 unacceptable; Waller Duncan LSD (K=100)=0.6.

Maine Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for late varieties grown at Presque Isle, Maine - 1987.

Variety	Total Yield cwt/A	Marketable Yield percentage cwt/A	Size Distribution by Class (%)						Size Distribution (%)		Spec. Grav.	
			1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.		
Late Test - 119 days												
Katahdin (std)	311	268	100	3	9	16	39	29	4	93	68	80
BelRus	210	194	72	39	47	11	2	1	-	14%	over 8 oz.	99
Ontario	330	227	85	5	15	21	44	14	1	94	58	72
Shepody	314	207	77	10	32	30	14	14	-	58%	over 8 oz.	85
A76147-2	407	248	92	13	36	31	12	8	-	51%	over 8 oz.	87
AF465-2	249	239	89	42	48	9	1	0	-	10%	over 8 oz.	90
AF522-1	360	310	116	27	51	19	3	0	-	22%	over 8 oz.	89
AF522-5	280	237	88	33	47	15	5	0	-	20%	over 8 oz.	98
CS7635-4	306	276	103	2	10	19	53	15	1	97	68	82
NY71	324	298	111	2	10	17	50	19	2	96	69	84
NY72	384	322	120	3	11	14	42	26	4	93	68	84
NY76	341	310	116	7	22	26	40	5	0	93	45	81
NY81	359	236	88	3	7	14	49	25	2	95	74	85
Waller Duncan												
LSD (K=100)	42	50										4

† Size classes for Katahdin, Ontario, CS7635-4, NY71, NY72, NY76, and NY81: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/4"; 3 = 2-1/4 to 2-1/2"; 4 = 2-1/2 to 3-1/4"; 5 = 3-1/4 to 4"; 6 = over 4". Size classes for BelRus, Shepody, A76147-2, AF465-2, AF522-1 and AF522-5: 1 = 0 to 4 oz.; 2 = 4 to 8 oz.; 3 = 8 to 12 oz.; 4 = 12 to 16 oz.; 5 = over 16 oz.

Maine Table 6. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color for late varieties grown at Presque Isle, Maine - 1987.

Variety	Plant Data <sup>1</sup>		Tuber Data <sup>1</sup>		Tuber Defects (%)			Hollow Heart Rating	Chip <sup>2</sup> Color
	Size Matur. at 7-20 Vinekill	Shape	Appear-ance	Total	Sun-		Growth cracks		
					burn	mis-shapen			
Late Test-119 days									
Katahdin (std)	8	4	1	7	7.6	4.6	2.8	0.2	8.0
BelRus	4	2	7	7	7.5	1.0	5.9	0.6	6.8
Ontario	9	8	3	4	27.0	1.8	22.8	2.4	8.8
Shepody	7	4	8	4	23.9	6.5	15.9	1.5	7.4
A76147-2	9	6	6	5	34.4	3.2	3.7	27.5	8.3
AF465-2	6	2	6	7	3.3	0.1	2.4	0.8	7.3
AF522-1	7	5	6	5	13.7	1.7	11.5	0.5	8.8
AF522-5	6	3	6	7	15.3	1.5	12.8	1.0	8.0
CS7635-4	6	7	1	5	7.0	0.2	1.4	5.4	7.8
NY71	5	5	1	5	4.0	1.6	0.3	2.1	5.6
NY72	8	6	1	6	10.1	6.1	2.6	1.4	7.3
NY76	8	2	1	7	2.5	1.0	1.2	0.3	5.6
NY81	7	5	2	4	31.6	2.2	0.7	28.7	7.6

<sup>1</sup>See standard NE-107 rating system for key to codes.

<sup>2</sup>Chip color: 1-7 acceptable, >7 unacceptable; Waller Duncan LSD (K=100)=0.5.



Maine Table 7. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for russeted varieties grown at Presque Isle, Maine - 1987.

Variety	Total Yield cwt/A	Marketable Yield		Size Distribution by Class (%)					Size Distribution (%)		Spec. Grav.
		cwt/A	percentage of std.	1	2	3	4	5	Over 8 oz.	Over 12 oz.	
<u>Russet Test -127 days</u>											
Russet Burbank (std)	294	100	100	36	37	22	2	3	27	5	85
NemaRus	302	266	266	22	41	23	9	5	37	14	81
A7411-2	300	236	236	17	34	32	13	4	49	17	88
A72685-2	322	291	291	19	36	22	12	11	45	23	89
A75188-3	317	283	283	14	38	32	12	4	48	16	76
B9596-2	236	216	216	28	53	17	2	0	19	2	86
Waller Duncan											
LSD (K=100)	33	35									2

† Size classes: 1=0 to 4 oz.; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5=over 16 oz.

Maine Table 8. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color for russeted varieties grown at Presque Isle, Maine - 1987.

Variety	Plant Data <sup>1</sup>		Tuber Data <sup>1</sup>		Tuber Defects (%)			Hollow Heart Rating	Chip Color <sup>2</sup>	
	Size Matur. at 7-20 Vinekill	Shape	Appear-ance	Total	Sun- burn		Growth cracks			
					Mis-shapen	mis-shapen				
Russet Test-127 days										
Russet Burbank	7	4	8	2	66.1	2.1	60.4	3.6	1	8.4
(std)										
NemaRus	5	3	7	8	11.9	5.0	6.4	0.5	0	7.6
A7411-2	5	4	9	7	21.5	1.6	15.0	4.9	0	8.4
A72685-2	7	5	5	6	9.6	0.6	7.8	1.2	0	9.1
A75188-3	5	4	7	6	10.8	0.7	8.9	1.2	0	9.4
B9596-2	4	2	7	6	8.7	0.5	7.9	0.3	0	8.6

<sup>1</sup>See standard NE-107 rating system for key to codes.

<sup>2</sup>Chip color: 1-7 acceptable, >7 unacceptable; Waller Duncan LSD (K=100)=0.8.

Maine Table 9. Chip color from 38° F storage, potential for reconditioning, after cooking darkening indices, washed appearance ratings, days to sprout formation (length of dormancy), and storage weight losses at 38 and 50° F for 39 potato varieties grown at Presque Isle, Maine during 1986 and stored during the 1986-1987 storage season.

Variety	Processing from 38° F		After Cooking <sup>3</sup> Darkening	Washed Appearance <sup>4</sup> Index	Days to Indicated Sprout Length <sup>5</sup>		Storage Wt. Loss <sup>6</sup> (%)	
	Chip <sup>1</sup> Color	Recond. <sup>2</sup>			pip	1/2 inch	38 F	50 F
Donna	10.0	9.9	7.4	70(5) PC, CS, RS, SS, DR, BH	53	88	6.1	12.9
Katahdin	10.0	9.4	7.4	76(6) PC, SB, SS, LE, B	56	119	7.4	14.8
Kennebec	9.9	9.3	7.0	69(5) PC, SB, GC, RS, SS, LE, B	88	151	5.5	9.4
NemaRus	10.0	8.8	7.2	61(5) SB, SS, NR, B	51	128	7.9	17.3
NorKing Russet	10.0	9.5	7.0	74(4) SS, GC, NR, B	84	147	6.6	13.7
Russet Burbank	9.8	8.6	6.6	54(3) SS, M, NR, B	135	170	4.6	6.2
Russet Norkotah	10.0	9.8	6.8	37(2) SS, BS	84	140	6.2	12.9
Russette	10.0	9.2	7.8	63(4) SZ, SB, GC, M, B	114	191	5.3	9.7
Shepody	10.0	9.7	7.5	62(3) M, PC, SB, RS, SS	70	119	5.4	9.3
Superior (early)	10.0	9.6	7.8	82(4) PC, SS, BS, LE	79	128	6.4	14.1
Superior (medium)	10.0	9.2	7.9	88(5) PC, SS, BS, PS	81	123	5.1	14.1
A7411-2	9.7	8.5	6.8	61(3) GC, SS, NR, B	51	135	5.7	14.3
A72685-2	9.9	9.5	6.8	32(2) SB, GC, SS, M, DR, NR, B	58	114	4.6	14.2
A75188-3	10.0	9.5	7.5	46(3) SB, GC, CS, M, NR, B	156	184	6.4	6.3
A76147-2	9.9	9.6	6.8	43(2) SB, SS	58	121	5.6	17.9
AF339-5	10.0	9.8	7.5	53(2) M, PC, GC, RS, DR, LE	72	128	12.3	11.0
AF465-2	10.0	9.2	6.7	74(5) GC, SZ, NR, PS	74	151	5.5	18.5
AF474-2	10.0	9.8	7.2	78(6) PC, SB, RS	67	130	6.1	20.5
AF522-1	10.0	9.9	6.8	74(3) BS, NR, B	49	98	7.0	20.7

Maine Table 9. - Continued.

Variety	Processing from 38° F		After Cooking <sup>3</sup> Darkening <sup>3</sup>	Washed Appearance <sup>4</sup> Index	Days to Indicated Sprout Length <sup>5</sup>		Storage Wt. Loss (%)	
	Chip <sup>1</sup> Color	Recond. <sup>2</sup>			pip	1/2 inch	38 F	50 F
AF522-5	10.0	10.0	7.3	82(6)LE	81	151	4.2	12.5
B9340-13	10.0	9.3	7.6	50(4)PC,SB,SS,BS,LE,B	67	130	7.2	18.0
B9540-55	9.5	7.9	7.2	58(3)SB,DR,BS,NR	65	128	8.2	17.0
B9569-2	10.0	10.0	6.8	64(6)LE,M	79	142	6.8	12.7
B9596-2	10.0	9.5	8.0	67(3)GC,NR,B	58	177	5.9	10.1
CF7679-15	9.9	9.9	7.3	83(5)PC,SB,GC,RS,BS,LE	79	149	8.5	11.7
CF7750-1	10.0	10.0	6.9	71(4)LE,NR,M,B	53	109	5.3	17.7
CS7296-5	10.0	10.0	7.1	86(4)PC,SS,BH	79	149	12.4	14.7
CS7635-4	10.0	9.8	6.8	78(5)PC,RS,LE,B	77	161	6.4	10.7
CS7639-1	10.0	10.0	8.5	85(5)PC,RS,SS,SR,LE	79	142	7.6	14.8
CS7697-24	10.0	10.0	6.9	73(6)SS	72	128	6.0	27.4
CS77120-8	10.0	9.9	7.7	68(4)PC,DR,BS,BH,B	81	158	6.8	19.6
F70021	10.0	10.0	7.2	87(6)RS,SS,BH,ST,PS	58	100	8.5	23.7
NY71	9.9	9.2	7.2	67(5)PC,SB,CS,SS,RS	70	140	6.6	11.7
NY72	10.0	9.8	6.4	31(2)PC,RS,SB,SS,DR,B	98	168	5.9	8.5
NY76	9.8	9.0	7.2	91(7)PC,RS,LE	56	133	6.1	14.8
NY79	9.6	9.3	7.2	86(5)PC,SB,RS,SS,ST	72	184	9.5	13.3
NY81	10.0	9.0	6.8	52(4)PC,SB,GC,CS,RS,SS,B	70	161	8.6	9.8
W752	10.0	8.1	7.6	58(4)PC,SZ,B	67	116	7.2	21.9
WF591-IR	10.0	10.0	7.1	83(3)SS,GC,B	67	151	4.4	9.8

Maine Table 9. - Continued.

- <sup>1</sup> Stored at 38° F, 85% R.H. from harvest. Chip colors: 1-7 acceptable, >7 unacceptable.
- <sup>2</sup> Reconditioned samples were placed at 70° F for a three wk period starting on January 22, 1986. Chip color rating scale: 1-7 acceptable, >7 unacceptable.
- <sup>3</sup> Samples were stored at 45° F, 85% R.H. from harvest until January 19, 1986 and were then warmed to 65° F for 96 h. Diced tubers were blanched for five min., cooled to 120° F, then rated after 30 min with a Munsel Neutral Color Scale. Higher indices indicate lighter color.
- <sup>4</sup> Unreplicated samples weighing approximately 7500 grams were stored at 45° F and 85% R.H. until mid-January. Tubers were then washed and graded. First number indicates % U.S. #1 tubers in sample. Numbers in parentheses indicate subjective appearance of the sample using standard NE-107 appearance code. Superscripts indicate codes for major external defects as follows: M=misshapen, NR=nonuniform russetting, PC=poor color, SB=sunburn, GC=growth cracks, CS=common scab, SS=silver scurf, RS=russet scab, DR=dry rot, SR=soft rot, BS=black scurf, LE=enlarged lenticels, B=bruises, BH=buttonhole, PS=pitted scab, SZ=small tuber size, ST=stolons adhere to tubers.
- <sup>5</sup> Tubers were stored at 45° F, 85% R.H.
- <sup>6</sup> Percentage sprout and weight loss following storage from harvest until April 8, 1987, at indicated temperature and 85% R.H.

Maine Table 10. French fry color and texture of selected potato clones and varieties under simulated processing conditions. All varieties were grown at Presque Isle, Maine during 1987.

Variety	Color Grade <sup>2</sup>		Grayness <sup>3</sup>		Mealiness <sup>4</sup>		Comments <sup>5</sup>	Overall Texture <sup>6</sup> Rating
	Inner	Outer	Inner	Outer	Inner	Outer		
BelRus	00	00	4.0	4.0	4.2	4.8	U, Gf	0
NemaRus	00	00	3.8	4.0	4.0	4.7	U	0
Russet Burbank (std)	00	00	4.0	3.8	3.9	4.9	U	0
Shepody	00	00	4.0	4.0	4.1	4.7		0
A7411-2	00	00	3.6	3.9	4.4	4.6		0
A72685-2	0	0	4.0	4.0	3.8	4.7	U	0
A75183-3	1	1	4.0	4.0	3.3	4.4	Ir	0
AF465-2	00	00	4.0	4.0	3.6	4.8		0
AF522-1	0	0	4.0	4.0	4.8	4.7	Ir	+
AF522-5	0	0	4.0	4.0	4.3	4.8	Ir	0
B9596-2	0	0	4.0	4.0	3.9	4.9	Ir	0
Waller Duncan LSD (k=100)			0.3	NS	0.8	NS		

<sup>1</sup>Four center and four adjacent raw tuber slices were cut from each of five tubers. The slices were rinsed in cool water, blanched for 8 min at 170°F, par fried at 375°F for 80s, and quick frozen at -30°C in plastic bags. Four such replications were processed and held at -15°C until evaluation. Prior to evaluation, samples were finish fried at 360°F for 2-1/2 min., blotted dry with a paper towel, and cooled 6 min. All samples were processed and evaluated by the Department of Food Science (R. True and T. Work), University of Maine; Orono, ME. Processing was conducted on December 1. All tuber samples were stored at 50°F, 85% R.H. from harvest until processing.



Maine Table 10. Continued.

<sup>2</sup> Color Grades are from U.S.D.A. color standards chart #64-1, third edition.

<sup>3</sup> Grayness indices represent weighted means derived from the following evaluation scale: 4=no graying; 3=slight graying; 2=moderate graying.

<sup>4</sup> Mealiness indices represent weighted means derived from the following evaluation scale: 5=dry, mealy; 4=mod. mealy, slightly moist; 3=slightly mealy, mod. moist; 2=soggy, not mealy; 1=very soggy, not mealy.

<sup>5</sup> Comments: Ir=french fries were irregular in color; dark blotches detracted from appearance of product.  
U=french fries were very uniform in color  
Gf=exceptionally good flavor

<sup>6</sup> Overall texture rating: + texture rated significantly better than Russet Burbank.  
0 texture rated not significantly different from Russet Burbank.  
- texture rated significantly poorer than Russet Burbank.

Alvin F. Reeves, Robert B. Long, Garland S. Grounds,  
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Potato Breeding

Seed and seedling production. As in past years crosses were directed toward three goals: a long russet processing variety; a round white table variety; and a chipping variety. Scab resistance is emphasized in all crosses. A total of 36 parent plants were intercrossed in 65 different combinations to produce 162,125 seeds. An additional 585,100 seeds were obtained from field plantings of 22 russet selections. Greenhouse plantings of true seeds yielded 61,031 seedlings from which 53,935 tubers were harvested.

Seedling selection. A total of 363 (0.82%) new selections were saved from 44,091 single hills. From the 245 12-hill plots, 51 (20.8%) were saved for further testing. Eighteen 60-hill plots, and 24 advanced selections were maintained and tested.

Protoclonal selections. Field testing of 30 clones derived from Russet Burbank leaf cells included replicated yield tests of 19 of the advanced protoclones. None were equal to the standard Russet Burbank in yield, but three were equal in specific gravity.

Disease tests. In cooperation with Drs. Franklin Manzer, Richard Storch, Bill Brodie, Robert Goth, Gilbert Banville and Simeon Leach, a number of selections were tested for resistance to several diseases. All tests were inoculated either directly or on spreader rows within the plots. Results were as follows: 8 of 30 selections tested were resistant to late blight; 9/62 to acid scab; 36/94 to common scab; 78/94 to net necrosis; 2/24 to leafroll; 7/16 to verticillium; 4/24 to golden nematode; 4/15 to Fusarium roseum; 1/15 to Fusarium solani; and 0/2 to ring rot.

Physiological disorders. Additional tests for physiological disorders showed 5 of 17 resistant to hollow heart; 3/16 to blackspot bruising; and 2/16 to shatter bruising.

Yield tests. A total of 45 selections were grown in replicated yield tests in 1987. Eighteen yielded better than the control varieties and 16 had higher specific gravities. Ten selections were better than the controls for both qualities. Early maturing selections were given 120 pounds of nitrogen per acre and killed at 90 days from planting. Medium maturity selections were given 140 pounds of nitrogen and killed at 100 days; medium-late maturing selections were given 160 pounds of nitrogen and killed at 108 days; late maturing selections were given 160 pounds of nitrogen and killed at 116 days.

Chip tests. After processing in December, February and April from four different storage temperatures, five selections and Lenape had better chip color than Monona: AF236-1, AF874-8, AF875-16, AF897-21, and CS7232-4.

Processing tests. Ruth True and Terry Work (Food Sciences Department of the University of Maine in Orono) conducted french fry tests of seven selections. One (AF236-1) had better color than Russet Burbank, and one (AF465-2) had a lower mealiness rating than Russet Burbank.

Grower trials of advanced selections. Seven unnamed selections were grown on commercial farms in 1987: AF236-1, AF330-1, AF465-2, CS7635-4, CS7697-24, WF564-3 and WF591-1. Poor tuber shape was found in WF564-3, and AF330-1 had rot in the seed and harvested tubers. Both of them will be dropped. The other five had good results, and will be retested.

Russets: AF465-2 had the best tuber type; however, some blackleg was noted.

Chipping selections: AF236-1 had good chip color and high dry matter. It will be named Somerset. CS7232-4 and AF875-16 continue to show promise.

Round white table varieties: CS7697-24 and CS7635-4 give high yields at early and late harvest, respectively.

Table 1 summarizes the advanced selections in the Maine potato breeding program.

Maine Table 1. Characteristics of some advanced selections from the Maine potato breeding program.

Pedigree	Resistance to $\frac{5}{4}$																		
	Maturity $\frac{1}{2}$	Skin color $\frac{2}{2}$	Tuber type $\frac{3}{3}$	Yield $\frac{4}{4}$	Cooked quality $\frac{4}{4}$	Chip color $\frac{4}{4}$	Percent dry matter $\frac{4}{4}$	Storage qualities $\frac{4}{4}$	Bruising $\frac{4}{4}$	Hollow Heart $\frac{4}{4}$	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Common scab	Verticillium	Golden nematode
Round white tablestock																			
Early Maturing																			
AF1094-19	ME	W	R	G	F	U	A	F	F	F	F	F	R	F	F	F	M	F	S
AF1115-3	ME	W	R	E	F	U	G	F	F	F	F	F	R	F	F	M	R	S	S
AF1203-5	ME	CN	R	G	F	A	G	F	F	F	F	F	R	F	F	S	S	M	R
CS7639-1	E	W	RO	E	G	U	M	F	A	M	R	S	R	S	S	S	S	M	R
CS7697-24	E	WC	R	E	G	M	A	F	A	A	S	F	R	S	S	S	S	M	S
Mid Season																			
AF828-5	ML	W	RO	G	A	U	M	F	E	E	S	S	R	S	R	S	S	M	R
AF1060-2	ML	W	R	E	F	U	G	F	F	F	F	F	R	F	F	S	S	R	S
AF1206-2	M	W	R	A	F	U	M	F	F	F	F	F	R	F	F	S	M	R	S
Full Season																			
AF1161-1	ML	W	R	G	F	M	M	F	G	A	F	F	F	F	F	S	S	M	F
CS7635-4	L	W	R	E	E	A	G	F	A	A	R	S	R	S	R	R	R	R	S
CS7684-9	M	C	RO	M	E	M	M	F	A	A	R	S	R	S	S	S	R	R	S
Long russet for processing or count box																			
AF465-2	M	R	OL	M	A	M	A	F	E	M	S	S	R	S	S	R	R	S	S
AF522-5	M	R	OL	M	G	U	E	F	A	A	S	R	R	S	S	S	M	M	S
AF1112-14	E	R	L	M	F	M	G	F	F	F	F	F	R	F	F	F	M	F	S
AF1165-1	ME	R	L	M	F	A	A	F	F	F	F	F	R	F	F	F	R	F	S
AF1166-4	ME	R	O	A	F	M	M	F	F	F	F	F	R	F	F	S	M	R	S

Maine Table 1. Continued

Resistance to 5/

Pedigree	Maturity <u>1/</u>	Skin color <u>2/</u>	Tuber type <u>3/</u>	Yield <u>4/</u>	Cooked quality <u>4/</u>	Chip color <u>4/</u>	Percent dry matter <u>4/</u>	Storage qualities <u>4/</u>	Bruising <u>4/</u>	Hollow Heart <u>4/</u>	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Common Scab	Verticillium	Golden nematode
Long white for processing or count box																			
CS7984-3	ML	W	OL	A	F	A	E	F	G	M	S	S	R	S	S	R	M	M	S
Chipping type																			
AF236-1	ME	WC	OL	G	A	E	G	A	A	M	S	S	R	R	R	S	S	S	S
AF845-11	M	B	R	G	F	G	E	F	A	G	S	S	R	S	M	M	S	S	S
AF874-8	M	W	RO	M	F	E	G	F	E	G	S	S	R	S	S	S	S	S	S
AF875-15	ME	C	R	A	F	G	E	F	G	E	F	S	R	S	S	M	R	M	S
AF875-16	ML	W	R	G	F	E	E	F	G	G	S	S	R	S	S	M	S	R	S
AF875-17	ML	W	R	G	F	G	E	F	M	G	S	S	R	R	S	R	R	S	R
AF879-3	M	W	R	G	F	G	E	F	G	E	S	S	R	S	S	R	S	M	R
CS7232-4	E	WC	R	M	G	E	G	G	E	E	S	S	R	S	S	M	M	S	S

1/ E = early, M = medium, L = late.2/ W = white, C = cream, B = buff, R = russet, N = netted.3/ R = round, O = oblong, L = long.4/ Rated as U = unacceptable, M = marginal, A = acceptable.  
G = good, E = excellent, F = further testing needed.5/ R = resistant, M = moderately resistant, S = susceptible,  
F = further testing needed.

## MICHIGAN

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The potato variety evaluation and management program is designed to (a) identify improved cultivars better suited to Michigan's fresh market and the processing industry; (b) conduct intensive evaluations of selected cultivars to determine optimum production management inputs that improve potato market quality.

In all variety evaluations, special consideration was given to quality parameters. The focus was on tuber appearance, size distribution, external and internal defects, specific gravity (dry matter content), chip color, storability and culinary properties. Also of significant interest to Michigan is tolerance to common scab and bruising. Potential chipping varieties are stored in two storage environments (45 and 52° F) for subsequent quality evaluations.

### DATES-OF-HARVEST TRIAL FOR ROUND VARIETIES

The 1987 dates-of-harvest trial was conducted at the Montcalm Research Farm. Fourteen selected varieties were tested for their marketable maturity and adaptability to Michigan. These included seven released varieties and seven advanced selections. The performances of these varieties were evaluated at three harvest dates, 98, 115 and 140 days after planting. Four replications of a randomized complete block design were harvested at each harvest date. Varieties were planted May 4 in plots 23 feet x 34 inches in size with an in-row spacing of 12 inches.

The previous crop was alfalfa. Fertilizers and Temik 15G were applied as described in the introduction. The hilling and herbicide application were all done just as the potatoes were emerging, which was May 18. Immediately after hilling, a tank mix of Dual at 2 lbs/A plus Lexone at  $\frac{1}{2}$  lb/A were applied for weed control and no further tillage was performed until harvest. During the growing season, the crop was irrigated 10 times according to the MSU irrigation scheduling program. The amount of water applied ranged from 0.8 to 1.0 inch per application. The minimum profile moisture content allowed was 50 percent. Fungicides and insecticides were applied depending on need. Fungicides for early blight control were alternated and generally scheduled at weekly intervals. An early and late blight forecasting program from Wisconsin was used as a guide to commence spraying. Relative humidity and temperature at canopy levels were monitored for this purpose. All weather data was collected with a programmed Campbell's CR21 Micrologger.



For chip color determinations, 20 tubers were taken at random and a slice from each tuber used for the test. Agtron E-10 Colorimeter was used for color measurements. For after-cooking darkening, peeled halves of three tubers picked at random were cooked in steam and evaluated at 0, 1 and 24 hours. Susceptibility to blackspot bruising was evaluated in artificially bruised and check treatments. Artificial bruising was done by placing 20 potatoes inside a wooden drum and turning 10 revolutions at a moderate speed. In the check treatments, potatoes were tested without artificial bruising, so that any blackspot observed occurred during harvest. The artificially bruised tubers were kept for 48 hours at room temperature prior to peeling. A Hobart peeler was used for peeling the tubers.

## Results

The yield and quality parameters of potato varieties at the three harvest dates are presented in Tables 1, 2 and 3. In 1987, the weather conditions during the growing season was generally unfavorable for potatoes. Lack of sufficient rainfall combined with high day and night temperatures in June and July contributed to an overall reduction in tuber yield and specific gravity in all varieties. Owing to the dry conditions, early blight was minimal in the trials.

Among the early maturing varieties, Onaway produced the highest U.S. #1 yield and was free of internal defects. Conestoga produced average yields with a good chip color but the gravity was low. Eramosa matured very early and produced smooth tubers. The seed of Eramosa used for this trial had severe pitted scab.

Saginaw Gold (MSU seedling 002-171) was maintained in Ontario, Canada and in their trials it has been a consistently, excellent chipper. Yields were greatest at 115 days with excellent chip color. However, the dry matter was lower than desired for processing. A joint release of this variety between MSU and Agriculture Canada is being considered for 1988.

Among the medium to medium-late maturing varieties, MS700-83, Michigold, Atlantic, MS716-15 and MS702-80 performed well. MS70083 produced very high U.S. #1 yields, and acceptable chip color but the gravity was lower than preferred by a chipper. Michigold yielded similar to MS700-83 but with higher gravity. Atlantic had the highest gravity with average yields but was susceptible to internal defects. MS716-15 produced above average yields with excellent quality, high gravity and excellent chip color. MS702-80 produced above average yields with a high percent of U.S. #1 and the chip color was exceptionally good.

Among the late maturing varieties, MS700-70 and LA01-38 were the two highest yielding lines at the second and third harvests. Both had a high percent of U.S. #1 tubers, good gravity and chip color. Most varieties in the trial were free of internal defects.

In the culinary tests, undesirable levels of after-cooking darkening were found in MS700-83 and B9140-32 (Table 4). Some sloughing was observed in MS716-15 and Atlantic, which have high specific gravity. Susceptibility to blackspot was evaluated at the 115 and 140 harvest dates (Tables 5 and 6).

In artificially bruised treatments, the varieties highly resistant to blackspot were Conestoga and MS716-15. Moderate levels of resistance were found in MS700-70, MS702-80, Onaway, Eramosa and B9140-32. Varieties LA01-38, W832 and Atlantic were susceptible. In the check treatments, most varieties showed no blackspot. Blackspot at the 140-day harvest was slightly higher than the 115-day harvest.

Variety  
Characteristics

MS700-83 - Round white, mid-season maturity and above average yields with medium gravity. Has potential for chipping. In some years, after-cooking darkening has been a drawback. Possesses some scab resistance and growth crack has been noted in some trials.

Michigold - Round tubers with yellow flesh, mid-season maturity. Produces above average yields with high gravity. It sets heavy and produces a golden color chip when processed from field and short term storage.

MS702-80 - Round white, mid-season maturity with average yields. Has medium gravity but produces an excellent chip color. It has good scab tolerance, and no internal defects. Has a tendency to produce oversized tubers at a 12 inch spacing.

MS716-15 - Round white, medium late maturity with above average yields. It has high gravity, excellent chip color and no internal defects. Tubers are well shaped and a smooth general appearance.

MS700-70 - Round white, late season maturity with prolific yields. It has high gravity and the chip color is acceptable. Tubers are somewhat rough in appearance with deep eyes. Tends to produce oversized tubers at 12 inch spacing.

LA01-38 - Round white, late season maturity with prolific yields. It has a medium to high gravity with acceptable chip color. Tends to produce oversized tubers at 12 inch spacing.

Saginaw Gold - Round to oblong tubers with light yellow flesh and early to mid-season maturity. It has an excellent chip color but the dry matter content was lower than desired for processing.

W832 - Round white, mid-season maturity with below average yields. It has medium gravity and the chip color is acceptable.

Conestoga - Round to oblong white, early maturity with average yields, gravity and an excellent chip color. Early blight is a problem in some years.

Eramosa - Round-oblong white and very early maturity. The tubers have a smooth general appearance with no internal defects. Gravity is lower than Onaway. Has potential for the early fresh market.

Sunrise - Round-oblong and early to medium maturity. Has average yields with low gravity. Susceptible to growth cracks and scab in some years.

Onaway - Round to oblong and early maturity. Has above average yields with low gravity. Minimal internal defects. Has a tendency to produce oversized tubers and is susceptible to growth cracks and early blight.

Atlantic - Round white, mid to late season maturity. Above average yields with high gravity. Has excellent chip color and is the major chipping cultivar in Michigan. It is susceptible to internal brown spot (heat necrosis), hollow heart and scab.

#### DATES-OF-HARVEST TRIAL WITH COUNT PACK VARIETIES

Seventeen russet and long varieties were evaluated for the count-pack market and processing potential at two harvest dates, 100 and 140 days. The results are presented in Tables 7 and 8.

With few exceptions, most varieties were late maturing and did not perform well at the first harvest date. The varieties possessing good external quality at the second harvest were A78242-5, A76147-2, A79341-3, A79357-17, A74114-4 and HiLite Russet. Although Russet Norkotah had a good type, it had a high percent of undersize tubers.

The after-cooking darkening data is presented in Table 9. None of the potato varieties showed undesirable levels of darkening. Blackspot susceptibility data is presented in Table 10.

In artificially bruised treatments, the varieties that appeared to be highly resistant to blackspot were Russet Norkotah, A79341-3, HiLite Russet and A81556-1. Moderate levels of resistance were found in A74114-4, Shepody and Russet Burbank. Varieties Pak-136, A76147-2 and A69868-2 were susceptible.

In the check treatments, most varieties showed no significant blackspot.

HiLite Russet and Russet Norkotah had the best appearance after peeling.

Variety  
Characteristics

A76147-2 - Long, very light russet, late maturity with high yields and medium gravity. It has good external appearance and minimal internal defects. Has potential for count-pack market.

A78242-5 - Good early growth and vigor. Russet, maturity is late with above average yields and gravity. Has good external appearance and a tendency to produce a high percent of oversized tubers.

A79341-3 - Very late maturing russet, with high solids. Good external appearance and quality.

A79357-17 - Good early growth and vigor. Produced above average yields and medium gravity. Maturity is considered very late. Russet with good external appearance and quality.

A79239-8 - Has early emergence, good vine growth and early vigor. Maturity is considered late and similar to Russet Burbank.

Pak-136 - Mid to late season maturity with above average yields and gravity. Has a tendency to produce oversized tubers.

A74114-4 - Mid to late season maturity with above average yields and medium gravity. Russet, has good cooking qualities and resistance to blackspot. Has excellent external appearance and quality. Excellent potential for count-pack market.

Bak-P140 - Mid-season maturity with average yields but above average gravity.

HiLite Russet - A patented line, mid-season maturity with average yields and low gravity, somewhat similar to Russet Norkotah. Has good cooking qualities and resistance to blackspot. Has good external quality and appearance. Excellent potential for count-pack market.

Shepody - Long white, mid-late season maturity. Fared poorly in 1987 with below average yields and medium high solids. Maturity 2-3 weeks earlier than Russet Burbank normally. Some susceptibility to scab but has good external and internal qualities. Slow emergence and early establishment. Pre-cutting of seed is recommended.



Norgold Russet - Mid-season maturity with below average yields and gravity. Good external appearance and quality. Produced a high percent of undersized tubers.

Krantz - Oblong russet, mid to late season maturity with below average yields and gravity in 1987.

Sh-1 - A mutant of Shepody introduced by Plant Genetics, Inc. Plant stands were very poor due to the poor condition of the seed. It had a very low percent of U.S. #1 tubers because of the high proportion of pick outs.

A69868-2 - Fared poorly in 1987. Russet with below average yields and gravity. Produced a high proportion of undersized tubers.

Russet Norkotah - Oblong to long russet, early to mid-season maturity. Tubers have a very smooth external appearance with a gravity lower than Russet Burbank. Produced below average yields because of poor sizing. Because of the excellent appearance, it has potential in the count-pack market.

A81556-1 - Late season maturity with below average yields and gravity. It has excellent external appearance but the yields were too low in 1987 with a large proportion of pick outs.

#### UPPER PENINSULA TRIAL

Sixteen potato varieties were tested in a randomized completed block design with four replications in the Upper Peninsula. The results are presented in Table 11.

The tuber yield, size distribution and dry matter content of most varieties in this trial were excellent. The specific gravities were higher than at Montcalm trials.

#### ADVANCED ADAPTATION TRIAL

Entries to this trial consisted of selections from the 1986 adaptation trial and new releases from other states and provinces. Included also were 14 new MSU seedlings from crosses made in 1984. In 1987, 25 selected lines were tested in a lattice design with two replications. The data from tuber yield, size distribution, specific gravity and chip color are summarized in Table 12. Culinary test results are presented in Table 13. Except in MS402-1 and MS402-2, after-cooking darkening was not a problem. Some varieties, with higher specific gravities, showed a tendency to slough after boiling.

Blackspot susceptibility data is presented in Table 14.

In artificially bruised treatments, the varieties that appeared to be highly resistant to blackspot were MS401-1, MS402-8, NYD195-11, Rose Gold, ND1719-5R and MS401-2. Moderate levels of resistance were found in Onaway, MS402-6, MS402-1, MS401-8, MS401-4, F72004 and MS402-4. Varieties F7411-4, ND1859-3, MS401-3, MS402-2, NYD164-9, MS402-7 and ND2109-7 were susceptible.

In the check treatments, most varieties showed no significant blackspot.

MS401-1, ND1859-3 and ND1719-5R had the best appearance after peeling.

#### ADAPTATION TRIAL

Fifty-one new seedling introductions from North Dakota and 30 from New York were tested in eight-hill unreplicated plots in a Federer's Augmented design. On the basis of external quality, U.S. #1 yield and scab resistance, 16 lines were selected in the field. The data on tuber yield, size distribution, specific gravity and chip color are summarized in Table 15. These 16 lines are being further evaluated for chip color, storability and internal defects. Only those that meet the industry requirements for fresh market and processing will be further tested in 1988 in larger plots.

#### SCAB VARIETY TRIAL

In 1987 samples of several varieties and seedlings were planted in a replicated trial to determine their scab tolerance. The site had a known history of a severe scab problem. The tubers were also cut and scored for the incidence of internal brown spot (Table 16).



Michigan Table 1. First date of harvest yield data — Round white varieties —  
August 10, 1987 (98 days).

Variety	Yield cwt/a <sup>1/</sup>		% Size Distribution					Spec. Grav.	Agtron <sup>2/</sup>		Internal <sup>3/</sup> Defects	
	U.S. #1	Total	U.S. #1	<2	2-3¼	>3¼	Pick Outs		Chip Color	HH	Int. Vas Nec. Dis.	
MS700-83	455	511	89	10	80	9	1	1.071	72	0	0	2
LA01-38	423	454	93	5	75	18	2	1.077	69	0	0	0
Atlantic	408	458	88	10	80	8	2	1.083	72	0	2	1
Onaway	393	441	89	3	63	26	8	1.063	36	0	0	0
Michigold	371	428	87	12	81	6	1	1.079	70	0	0	0
MS716-15	368	397	93	5	82	11	2	1.081	73	0	0	0
MS702-80	363	390	92	5	72	20	3	1.071	74	0	0	0
MS700-70	343	376	91	6	75	16	3	1.079	71	0	0	0
Saginaw Gold	333	409	81	7	75	6	12	1.073	71	0	0	0
Conestoga	323	365	88	10	83	5	2	1.069	68	0	0	0
W832	307	319	96	4	87	9	0	1.079	61	0	0	5
Sunrise	295	331	89	9	79	10	2	1.069	66	0	0	4
Eramosa	281	331	85	12	81	4	3	1.059	51	0	0	0
B9140-32	234	277	84	16	84	0	0	1.076	69	2	0	0
Average	349	391						1.074	66			

<sup>1/</sup>Yield based on the average of four replications of a RCB design.  
CV=9.9%;  $s_{\bar{x}}$ =17.5 at 5% for Duncan's Multiple Range Test (DMRT); LSD=49 cwt/a.

<sup>2/</sup>Agtron color: >60=excellent; 55-60=good; 50-55=fair; <50=not acceptable.

<sup>3/</sup>20 tubers cut to determine internal defects.

Michigan Table 2. Second date of harvest yield data — Round white varieties —  
August 27, 1987 (115 days).

Variety	Yield cwt/a <sup>1/</sup>		% Size Distribution					Spec. Grav.	Agtron <sup>2/</sup> Chip Color	Internal <sup>3/</sup> Defects		
	U.S. #1	Total	U.S. #1	<2	2-3¼	>3¼	Pick Outs			HH	Int. Vas Nec.	Dis.
LA01-38	557	572	97	3	61	36	0	1.076	71	0	1	2
MS700-70	530	558	95	3	48	47	2	1.082	69	0	0	1
MS700-83	501	563	89	9	72	17	2	1.074	65	0	1	2
Michigold	500	551	91	8	79	12	1	1.081	66	0	1	4
Onaway	479	523	91	5	63	28	4	1.062	39	0	0	1
Atlantic	478	521	91	7	72	19	2	1.085	73	1	2	3
MS702-80	446	478	93	4	60	33	3	1.072	74	0	0	3
MS716-15	429	459	93	6	75	18	1	1.082	72	0	0	2
Saginaw Gold	380	435	87	10	78	9	3	1.072	69	0	0	0
Conestoga	364	415	87	10	80	7	3	1.069	67	0	2	1
Sunrise	350	390	90	9	74	16	1	1.068	67	0	1	4
W832	341	362	94	4	81	13	2	1.078	65	0	0	4
B9140-32	324	355	91	9	87	4	0	1.077	64	0	0	3
Eramosa	<u>319</u>	<u>368</u>	86	9	78	8	5	<u>1.058</u>	<u>45</u>	0	0	1
Average	428	468						1.074	63			

<sup>1/</sup>Yield based on average of four replications of a RCB design.  
CV=12.7%;  $s_{\bar{x}}$ =27.2 at 5% level for DMRT; LSD=78 cwt/a.

<sup>2/</sup>Agtron color: >60=excellent; 55-60=good; 50-55=fair; <50=not acceptable.

<sup>3/</sup>20 tubers cut to determine internal defects.

Michigan Table 3. Third date of harvest yield data — Round white varieties —  
September 21, 1987 (140 days).

Variety	Yield cwt/a <sup>1/</sup>		% Size Distribution					Spec. Grav.	Agtron <sup>2/</sup> Chip Color	Internal <sup>3/</sup> Defects		
	U.S. #1	Total	U.S. #1	<2	2-3¼	>3¼	Pick Outs			HH	Int. Vas Nec. Dis.	
LA01-38	523	544	96	3	58	38	1	1.076	58	0	1	2
MS700-70	498	527	95	4	56	39	1	1.083	59	0	2	3
MS700-83	455	518	88	9	74	14	3	1.073	55	0	0	2
Michigold	452	497	91	8	75	16	1	1.081	60	0	0	2
Onaway	451	489	92	4	54	38	4	1.061	25	0	0	1
MS702-80	399	426	93	5	65	28	2	1.073	63	0	2	2
MS716-15	389	425	92	6	76	16	2	1.082	61	0	0	2
Atlantic	380	425	89	8	71	18	3	1.083	59	1	3	2
Conestoga	330	377	87	10	79	8	3	1.072	70	2	0	2
Saginaw Gold	329	426	77	6	67	10	16	1.073	65	0	0	1
Eramosa	320	359	89	6	83	6	5	1.056	30	0	0	0
Sunrise	285	328	87	10	78	9	3	1.071	60	0	3	4
W832	280	296	95	4	79	16	1	1.077	58	0	4	3
B9140-32	<u>261</u>	<u>312</u>	83	16	80	3	1	<u>1.076</u>	<u>62</u>	0	0	0
Average	382	425						1.077	56			

<sup>1/</sup>Yield based on the average of four replications of a RCB design.  
CV=12.8%;  $s_{\bar{x}}$ =24.5 at 5% level for DMRT; LSD=78 cwt/a.

<sup>2/</sup>Agtron color: >60=excellent; 55-60=good; 50-55=fair; <50=not acceptable.

<sup>3/</sup>20 tubers cut to determine internal defects.

Michigan Table 4. After-cooking darkening<sup>1/</sup> of potato varieties in the 1987 dates-of-harvest trial with round varieties.

Variety	0 Hours	1 Hour	24 Hours	Comments
LA01-38	1.0	1.0	1.0	
MS700-70	1	1	1	
MS700-83	1	2	2	2 tubers darkened
Michigold	1	1	1	
Onaway	1	1	1	
MS702-80	1	1	1	
MS716-15	1	1	1	Some sloughing
Atlantic	1	1	1	Some sloughing
Conestoga	1	1	1	
Saginaw Gold	1	1	1	
Eramosa	1	1	1	
Sunrise	1	1.5	1.5	1 tuber slightly dark
W832	1	1.5	1.5	1 tuber slightly dark
B9140-32	1	2	2	2 tubers darkened

<sup>1/</sup>Rating based on a scale of 1-5; 1 = no darkening, 5 = severe darkening (black) overall.

Michigan Table 5. Blackspot susceptibility at 115-day harvest — 1987.

Variety	Artificially Bruised		Check	
	% Tubers with Blackspot	Severity <sup>1/</sup>	% Tubers with Blackspot	Severity <sup>1/</sup>
MS700-70	15	0.15	5	0.05
MS716-15	5	0.05	5	0.05
MS702-80	15	0.15	—	—
MS700-83	15	0.15	5	0.05
Michigold	15	0.20	5	0.05
Saginaw Gold	—	—	0	0
Onaway	20	0.20	0	0
Sunrise	15	0.20	5	0.05
LA01-38	45	0.70	0	0
Atlantic	30	0.40	0	0
W832	40	0.50	0	0
Conestoga	0	0	0	0
Eramosa	10	0.10	0	0
B9140-32	<u>10</u>	0.10	<u>0</u>	0
Average	18		2	

<sup>1/</sup>Severity = Mean number of blackspot bruises per tuber.

Michigan Table 6. Blackspot susceptibility at 140-day harvest — 1987.

Variety	Artificially Bruised		Check	
	% Tubers with Blackspot	Severity <sup>1/</sup>	% Tubers with Blackspot	Severity <sup>1/</sup>
MS700-70	15	0.15	0	0
MS716-15	10	0.10	0	0
MS702-80	10	0.15	10	0.10
MS700-83	15	0.20	0	0
Michigold	15	0.20	5	0.05
Saginaw Gold	20	0.25	0	0
Onaway	10	0.15	0	0
Sunrise	15	0.20	15	0.15
LA01-38	60	1.00	15	0.15
Atlantic	30	0.35	5	0.05
W832	40	0.60	0	0
Conestoga	5	0.05	0	0
Eramosa	15	0.25	0	0
B9140-32	<u>15</u>	0.15	<u>5</u>	0.05
Average	20		4	

<sup>1/</sup>Severity = Mean number of blackspot bruises per tuber.



Michigan Table 7. First date of harvest yield data — Count pack varieties —  
August 12, 1987 (100 days).

Variety	Yield cwt/a <sup>1/</sup>		% Size Distribution				Pick Outs	Specific Gravity
	U.S. #1	Total	U.S. #1	<4	4-12	>12		
A76147-2	361	488	81	16	69	12	3	1.067
A78242-5	292	418	70	7	45	25	23	1.072
A79357-17	234	324	72	19	66	6	9	1.073
Bak P140	233	297	78	20	75	3	5	1.073
A74114-4	226	311	73	17	59	14	10	1.067
Norgold Russet	222	322	69	26	66	3	5	1.062
HiLite Russet	208	310	67	28	63	4	5	1.065
Russet Norkotah	203	308	66	32	63	3	2	1.068
A79341-3	200	274	72	24	62	10	4	1.077
A79239-8	198	285	70	20	66	4	10	1.072
Russet Burbank	186	365	51	29	51	0	20	1.073
Krantz	167	245	69	23	64	5	8	1.065
A69868-2	151	336	45	33	44	1	22	1.064
Pak-136	135	185	73	17	68	5	10	1.069
Shepody	104	214	48	46	46	2	6	1.075
Sh-1	76	164	46	38	45	1	16	1.063
A81556-1	<u>66</u>	<u>147</u>	45	48	43	2	7	<u>1.064</u>
Average	192	293						1.069

<sup>1/</sup>Yield based on the average of four replications of a RCB design.  
CV=21.8%;  $s_{\bar{x}}=24.2$  at 5% for DMRT; LSD=70 cwt/a.

Michigan Table 8. Second date of harvest yield data — Count pack varieties —  
September 22, 1987 (140 days).

Variety	Yield cwt/a <sup>1/</sup>		% Size Distribution				Pick Outs	Specific Gravity
	U.S. #1	Total	U.S. #1	<4	4-12	>12		
A78242-5	405	521	78	6	40	38	16	1.072
A76147-2	364	545	70	15	53	17	15	1.074
A79341-3	322	405	80	10	54	26	10	1.079
A79357-17	293	374	79	16	69	10	5	1.072
A79239-8	281	397	71	18	57	14	11	1.081
Pak-136	279	316	88	9	65	23	3	1.075
A74114-4	278	349	79	18	60	19	3	1.073
Bak-Pl40	262	327	80	19	74	6	1	1.076
HiLite Russet	241	332	73	23	64	9	4	1.068
Shepody	210	374	56	28	52	4	16	1.080
Norgold Russet	206	327	63	32	52	11	5	1.066
Russet Burbank	198	441	44	27	41	3	29	1.077
Krantz	193	261	73	19	63	10	8	1.070
Sh-1	188	436	43	20	36	7	37	1.068
A69868-2	169	335	51	30	48	3	19	1.069
Russet Norkotah	169	290	59	39	55	4	2	1.070
A81556-1	<u>154</u>	<u>298</u>	52	23	51	1	25	<u>1.068</u>
Average	248	372						1.073

<sup>1/</sup>Yield based on the average of four replications of a RCB design.  
CV=18.3%;  $s_{\bar{x}}=22.6$  at 5% level for DMRT; LSD=64 cwt/a.

Michigan Table 9. After-cooking darkening<sup>1/</sup> of long-type potato varieties in the 1987 dates-of-harvest trial.

Variety	0 Hours	1 Hour	24 Hours	Comments
Russet Burbank	1.0	1.0	1.0	
A74114-4	1.0	1.0	1.0	
HiLite Russet	1	1	1	
Russet Norkotah	1	1	1	
A81556-1	1	1	1	
A79357-17	1	1	1	
A76147-2	1	1.5	1.5	
Norgold Russet	1	1.5	1.5	
Shepody	1	1	1	Some sloughing
A79239-8	1	1.5	1.5	
Bak P140	1	1.5	1.5	Some sloughing
A79341-3	1	1.5	1.5	
Sh-1	1	1	1	
A78242-5	1	1	1	
Krantz	1	1	1	
A69868-2	1	1	1	
Pak-136	1	1	1	

<sup>1/</sup> Rating based on a scale of 1-5; 1 = no darkening, 5 = severe darkening (black) overall.

Michigan Table 10. Blackspot susceptibility of count pack varieties — 1987  
(140 days).

Variety	Artificially Bruised		Check	
	% Tubers with Blackspot	Severity <sup>1/</sup>	% Tubers with Blackspot	Severity <sup>1/</sup>
A78242-5	25	0.55	5	0.05
A76147-2	40	0.80	0	-
A79341-3	5	0.05	0	-
A79357-17	25	0.30	0	-
A79239-8	20	0.40	0	-
Pak-136	50	1.10	15	0.15
A74114-4	15	0.30	0	-
Bak P140	25	0.35	0	-
HiLite Russet	5	0.05	0	-
Shepody	10	0.10	0	-
Norgold Russet	25	0.30	0	-
Russet Burbank	10	0.10	0	-
Krantz	20	0.20	0	-
Sh-1	25	0.35	5	0.05
A69868-2	35	0.50	0	0
Russet Norkotah	0	0	0	0
A81556-1	<u>5</u>	0.05	<u>0</u>	0
Average	20		2	

<sup>1/</sup>Severity = Mean number of blackspot bruises per tuber.

Michigan Table 11. Tuber yield, size distribution and specific gravity of potato varieties in the Upper Peninsula — 1987.

Variety	Yield cwt/A		% Size Distribution				Pick Outs	Specific Gravity
	U.S. #1	Total	U.S. #1	2"	2-3¼"	3¼"		
A76147-2	634	661	96	4	34	62	0	1.080
700-70	426	465	92	8	52	39	1	1.086
A7411-2	413	449	92	7	61	31	1	1.089
Atlantic	406	447	90	10	62	28	0	1.090
716-15	383	432	88	12	62	26	0	1.086
700-83	357	405	88	12	59	28	1	1.079
Russet Burbank	351	475	74	26	62	12	0	1.087
Krantz	348	400	87	12	54	33	1	1.073
Russet Norkotah	314	373	84	16	68	16	0	1.070
Shepody	309	371	83	15	59	24	2	1.085
Michigold	304	382	79	20	59	21	0	1.088
702-80	291	345	83	17	58	25	0	1.075
Acadia Russet	268	337	80	20	67	13	0	1.080
Nooksack	252	283	89	11	62	27	0	1.089
HiLite Russet	249	301	83	17	65	18	0	1.069
Norgold Russet	<u>212</u>	<u>299</u>	70	30	56	14	0	<u>1.070</u>
Average	345	402						1.081

Michigan Table 12. Yield data of potato varieties in the advanced adaptation trial  
 — Harvested September 14, 1987 (133 days).

Variety	Yield cwt/a <sup>1/</sup>		% Size Distribution				Pick Outs	Specific Gravity	Chip Color
	U.S. #1	Total	U.S. #1	<2	2-3¼	>3¼			
MS401-5	591	647	91	4	61	30	4	1.086	58
Onaway	524	575	91	4	50	41	5	1.062	21
MS401-7	523	605	87	5	70	18	8	1.090	53
MS402-6	468	504	93	6	70	23	1	1.074	55
Atlantic	456	475	96	4	74	22	0	1.086	60
MS401-1	448	503	89	9	76	13	2	1.079	64
ND1859-3	447	495	90	7	75	15	3	1.077	57
Rose Gold	424	463	92	7	72	20	1	1.075	41
MS401-3	412	476	87	5	57	30	8	1.084	63
NYD164-9	394	438	90	9	73	17	1	1.079	67
MS402-7	372	416	89	2	54	35	9	1.073	52
MS402-1	371	422	90	7	73	17	3	1.075	45
F7411-4	368	474	78	10	51	27	12	1.091	60
ND2109-7	354	418	84	13	83	1	3	1.077	64
NYD195-11	349	355	98	2	71	27	0	1.067	61
MS401-8	349	401	87	5	62	25	8	1.080	62
MS402-2	348	404	86	13	80	6	1	1.069	53
MS401-4	342	387	87	13	87	0	0	1.077	-
F72004	337	359	94	6	78	16	0	1.068	36
ND1719-5R	330	374	88	11	70	18	1	1.063	32
MS401-2	327	425	77	5	56	21	18	1.081	58
MS401-6	307	340	91	5	58	33	4	1.077	61
MS402-4	250	257	70	28	69	1	2	1.064	39
Russet Burbank	247	442	56	20	46	10	24	1.075	47
MS402-8	<u>246</u>	<u>253</u>	97	3	56	41	0	<u>1.068</u>	64
Average	384	440						1.076	

<sup>1/</sup>Yield data based on the average of two replications of a lattice design.  
 CV=14.7%; LSD at 5%=112 cwt/a.



Michigan Table 13. After-cooking darkening<sup>1/</sup> of potato varieties in the 1987 advanced adaptation trial.

Variety	0 Hours	1 Hour	24 Hours	Comments
F7411-4	1.0	1.5	1.5	
ND1859-3	1	1.5	1.5	
F72004	1.5	1.5	1.5	
Rose Gold	1	1	1	Some sloughing
NYD164-9	1	1	1	Some sloughing
ND2109-7	1.5	1.5	1.5	Some sloughing
Onaway	1.5	1.5	1.5	
ND1719-5R	1	1	1	
NYD195-11	1	1.5	1.5	
MS401-1	1	1	1	
MS401-2	1	1	1	
MS401-3	1	1	1	
MS401-4	1	1	1	
MS401-5	1	1.5	1.5	Some sloughing
MS401-6	1	1	1	
MS401-7	1	1	1	Some sloughing
MS401-8	1	1	1	
MS402-1	1.5	2	2	
MS402-2	1.5	2.0	2.5	
MS402-4	1	1	1	
MS402-6	1	1	1	
MS402-7	1	1.5	1.5	
MS402-8	1	1.5	1.5	

<sup>1/</sup>Rating based on a scale of 1-5; 1 = no darkening, 5 = severe darkening (black) overall.

Michigan Table 14. Blackspot susceptibility of advanced adaptation trial varieties (133 days).

Variety <sup>1/</sup>	Artificially Bruised		Check	
	% Tubers with Blackspot	Severity <sup>2/</sup>	% Tubers with Blackspot	Severity <sup>2/</sup>
MS401-5	20	0.45	5	0.05
Onaway	10	0.10	5	0.05
MS401-7	15	0.15	0	-
MS402-6	10	0.15	5	0.05
MS401-1	0	-	0	-
ND1859-3	45	0.65	15	0.15
Rose Gold	5	0.05	5	0.05
MS401-3	40	0.90	5	0.05
NYD164-9	30	0.40	5	0.05
MS402-7	30	0.35	5	0.05
MS402-1	10	0.10	5	0.05
F7411-4	60	1.70	5	0.05
ND2109-7	30	0.45	0	-
NYD195-11	0	-	0	-
MS401-8	10	0.15	10	0.10
MS402-2	35	0.80	5	0.05
MS401-4	10	0.25	5	0.05
F72004	15	0.15	0	-
ND1719-5R	5	0.15	0	-
MS401-2	5	0.15	0	-
MS401-6	25	0.35	10	0.10
MS402-4	10	0.10	5	0.05
MS402-8	<u>0</u>	-	<u>0</u>	-
Average	20		2	

<sup>1/</sup>Varieties are arranged according to their U.S. #1 yield in 1987.

<sup>2/</sup>Severity = Mean number of blackspot bruises per tuber.

Michigan Table 15. Yield data of potato varieties in the adaptation trial —  
Harvested September 30 (145 days).

Entry No.	Yield cwt/a <sup>1/</sup>		% Size Distribution				Pick Outs	Specific Gravity	Chip Color
	U.S. #1	Total	U.S. #1	<2	2-3¼	>3¼			
NYE11-45	538	633	85	12	61	24	3	1.072	56
NYE28-2	529	566	93	5	66	27	2	1.080	69
ND2224-5R	509	556	92	8	83	9	0	1.061	53
ND2284-2	489	566	86	12	76	10	2	1.059	64
ND791-5R	451	547	82	9	68	14	9	1.056	54
ND2330-3	422	547	77	16	49	28	7	1.075	73
ND2130-11	365	422	86	12	72	14	2	1.071	77
NYE11-28	365	384	95	5	75	20	0	1.065	59
NYE57-13	345	432	80	20	64	16	0	1.074	72
ND2207-8RUSS	336	441	76	15	76	0	9	1.064	-
ND2319-3RUSS	326	460	79	18	50	29	3	1.065	-
NYE55-41	259	267	96	4	78	18	0	1.068	71
NYE11-15	249	317	79	18	79	0	3	1.069	70
ND2047-12RUSS	211	267	79	21	79	0	0	1.061	-
ND1538-1RUSS	201	298	68	29	55	13	3	1.061	-
NYD195-25	192	211	91	9	91	0	0	1.074	63
Atlantic	480	528	91	7	76	15	2	1.083	62
Onaway	442	461	96	4	83	13	0	1.063	-
Russet Burbank	221	365	61	21	61	0	18	1.074	-

<sup>1/</sup>Yield based on 8-hill unreplicated plots in a Federer's augmented design.  
CV=14.7%; LSD at 5%=112 cwt/a.

Michigan Table 16. Evaluation of seedlings and varieties for scab and internal brown spot.

Variety	Percent of Tubers with No Scab	Percent of Tubers with Less than 5% Scab	Comments	% IBS
Atlantic	47	80	Pitted	20
A74-114-4	44	63		0
A76147-2	46	77		10
B9140-32	3	30		0
Conestoga	33	51		10
Eramosa	65	98		20
HiLite Russet	61	97		ND
Krantz	62	90		0
LA01-38	0	33		0
Michigold	33	69		0
Norgold Russet	76	94		0
ND651-9	25	63	Pitted	0
Onaway	42	85		0
Rosegold	21	45	Pitted	10
Russet Burbank	42	84		20
Russet Norkotah	47	90		10
Saginaw Gold	22	66		0
Shepody	20	66	Pitted	0
Superior	64	92		10
MS700-70	39	59		10
MS700-83	9	46		30
MS702-80	56	92		0
MS716-15	33	75		0
MS401-1	17	23	Pitted	0
MS401-2	52	72	Some pits	20
MS401-3	43	61	Some pits	0
MS401-4	30	56	Pitted	80
MS401-5	0	39	Pitted	20
MS401-6	4	48	Some pits	60
MS401-7	46	80	Pitted	10
MS401-8	0	63	Some pits	20
MS402-1	39	64	Some pits	10
MS402-6	39	64		100
MS402-7	14	64		10
MS402-8	0	50		0

NEW YORK - LONG ISLAND

J.B. Sieczka, D. D. Moyer and R.C. Neese

- Early White In the early maturity class, Superior and F70021 produced yields that were not significantly different from each other (Table 1). The other entries, Norchip, Sunrise, and NY79 had yields that were significantly lower than Superior. Tubers of F70021 were oblong, have shallow eyes and have a smooth, white skin. This line had the best appearance rating in the test. Internal defects may be a problem.
- Main Season White The main season clones, Kennebec, A76147-2, C7635-4, NY72, and NY81 produced marketable yields that were significantly higher than the standard, Katahdin, at Riverhead, N.Y. (Tables 2 & 3). Of these only NY72 had appearance ratings equal to Katahdin. Hudson and Kennebec tubers had the worst appearance ratings. Kennebec tubers tended to be off-shape whereas Hudson and NY81 tubers had prominent lenticels and pinkeye disease. Internal necrosis was a problem in Atlantic and C7635-4. In the South Fork experiment with white-skinned clones, Katahdin, NY72 and NY81, produced yields that were significantly higher than the other entries tested (Table 4).
- Red Chieftain and the golden nematode resistant seedling, D191-2, produced yields that were not significantly different from each other (Table 5). The skin color of D191-2 was a deeper red than Chieftain. Both lines had a tendency to skin, but more skinning was noted on D191-2.
- Russet In the South Fork russet experiment BelRus, Coastal Russet, NemaRus and NorKing produced yields that were not significantly different from each other (Table 6). At the Long Island Horticultural Research Laboratory all the russet entries outyielded BelRus (Table 7). The highest yielding clone, A72685-2, had a tendency towards hollow heart as did NorKing. Coastal Russet produced a high yield of attractive tubers. Internal necrosis was observed in tubers of this line. Russet Burbank tubers tended to be off-shape. Russet Norkotah tubers had prominent lenticels and were irregular in shape. Internal disorders were a problem in AF522-5 tubers. The most promising USDA russet line is B9922-11 (Table 8). B9922-11 had a high yield of relatively attractive tubers. Hollow heart was a problem with this line NemaRus and B0184-26.
- Nitrogen and Spacing Nitrogen rate did not have an effect on yield, size distribution, specific gravity or internal defects of the five lines tested (Table 9). Within row spacing had a significant effect on the total and/or marketable yield of all the clones tested. Close spacing resulted in a significantly higher total yield of NY72, NY78, NY79 and NY81 and a greater marketable yield of Coastal Russet, NY72 and NY81. Specific gravity was not affected by spacing.

- Seed Piece Size      Total and marketable yields of Hampton were increased with increasing seed piece size, but the differences were not statistically significant (Table 10). Number of tubers per foot of row increased significantly as seed piece size increased, however, mean tuber weight did not change proportionately. Vines produced from one ounce seed pieces were small early in the season but were the most vigorous at time of vine kill. Specific gravity was not affected by seed piece size.
- Storage      After-cooking darkening and blackspot ratings for experiments conducted in 1986 are presented in Table 11. The only white-skinned clone that had after-cooking darkening ratings lower than Katahdin was B9792-136. BelRus was relatively free from after-cooking darkening. Russet-skinned entries that had ratings significantly lower than BelRus were: Coastal Russet, NemaRus, NorKing, A7411-2, A72685-2, AF522-1, and B9569-2.
- Acknowledgements:      Seed was provided by Robert L. Plaisted, Cornell University; Raymon E. Webb, USDA; and Gregory A. Porter, University of Maine. Special thanks are extended to the Corwith Brothers for providing the land, and assistance in the establishment of the experiment on the South Fork. Thanks are also extended to Carlos Squires, Jr. and Ray Halsey for the use of harvesting equipment.



Long Island Table 1 . Results of Early White Potato Experiment, Riverhead, N Y-1987  
Standard Variety : Superior

Standard variety	Clone	Yield (cwt/A)		% of		% of Total Yield					Internal Defects					Tuber Data				Depth	Comments				
		U S No 1		Std		2 -	2.5 -	3.3 -	4	>4	Def	Spec Grav	Vine Mat	HH	BC	SI	M	S	App			Color	Text	Shape	
		Total	2-4"	2-4"	2-4"	2.5	3.3	4																	
		456	350	100	100	30	46	1	0	14	68	3.3	3.3	1	0	0	0	0	5			W	RS	O-R	S
	Superior	456	350	100	100	30	46	1	0	14	68	3.3	3.3	1	0	0	0	0	5	W	RS	O-R	S		R,Nice
	Norchip	336	226	64	64	30	45	0	0	5	70	6.0	6.0	1	1	0	0	0	6	W	RS	R	MD		MT,Irr
	Sunrise	362	274	78	78	31	42	0	0	2	62	4.5	4.5	1	0	0	0	0	7	BU	SN	R	MS		R,Irr,DSE
	F70021	419	338	97	97	35	36	0	0	4	59	5.3	5.3	2	1	10	0	0	8	W	SN	O-R	S		MT,Sl Irr
	NY79	335	276	79	79	42	25	0	0	4	58	3.0	3.0	1	1	0	0	0	7	BU	SN	O-R	D		Sl F,Irr
	Waller-																								
	Duncan(0.05)	(55)	(62)																						

(2)

-Planted 4/10/87, roto beat 8/14/87, harvested 8/17/87. Within row spacing 9.3". Fertilizer applied at a rate of 1000 lb/A of 10-20-20 in bands at time of planting, 80 lbs of N sidedressed. Plot size 2 rows X 12', 4 replications.

-Defects = Total of all defects. Abbreviations for major defects listed in comments. G = growth cracks, L = prominent lenticels, M = misshapen, Pe = pinkeye, Rh = Rhizoctonia, S = sunburn, Sc = scab.

-Specific gravity determined by hydrometer, 1.0 omitted.

-Vine maturity rated on 8/8/87 on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous.

-Number of tubers with hollow heart, brown center, or internal necrosis of 40 tubers cut (10 per replication), Sl = slight, M = moderate, S = severe.

-Color - B = brown, C = cream, BR = bright red, Bu = buff, BW = bright white, MR = medium red, P = pink, Pu = purple, W = white, T = tan.  
Texture - HR = heavy russet, MR = moderate russet, MS = moderately smooth, N = netted, PR = partially russetted, SN = slight net, S = smooth.  
Shape - C = cylindrical, O = oblong, L = long, R = round.

Depth - D = deep, I = intermediate, S = shallow, VD = very deep, VS = very shallow.

Appearance - rated on a scale of 1 to 9; 1 = extremely rough, unattractive, 9 = smooth, attractive.

-Comment abbreviations. Att = attractive, CT = chain tubers, DAE = deep apical eyes, DSE = deep stem end, F = flat, HS = heat sprouts, Irr = irregular, JER = jelly end rot, Kn = knobs, MDAE = moderately deep apical eyes, =yellow.

Standard Variety : Katahdin

[illegible]

Long Island Table 3. Results of Advanced Golden Nematode Resistant Clones Experiment, Riverhead, NY -1987

Standard Variety : Katahdin

Clone	Yield (cwt/A)		% of		% of Total Yield							Internal Defects				Tuber Data							Comments		
	US No 1		Std	2-4"	2-5	2.5-			>4	Def	Spec Vine			Int Nec				Tuber Data							
	Total	2-4"				2-5	3.3	4			HH	BC	SI	M	S	App	Color	Text	Shape	Depth					
Kathdin	482	388	100		23	56	3	0	6	68	4.0	2	0	1	1	0	7.0	W	S	R	I	Nice			
Superior	505	411	106		37	44	0	0	3	70	1.5	3	0	0	0	0	6.0	BU	SN	O-R	I	Sl Irr			
NY72	716	643	166		13	67	9	1	3	80	5.8	0	2	0	0	0	6.5	BU	SN	R	I	DAE			
NY76	545	412	106		33	41	2	0	1	71	4.0	0	1	1	0	0	7.0	W	RS	R	S				
NY78	460	381	98		29	50	4	0	3	61	4.0	0	0	0	0	0	7.5	W	S	R-O	S	St,Sl Irr			
NY79	369	319	82		21	47	5	0	4	59	2.5	5	1	0	0	1	7.0	W	SN	R	S	Sl Irr			
NY81	626	429	110		10	42	17	1	25	72	5.5	11	2	0	0	0	5.0	BU	SN	R	I	Sl Irr			
Waller-																									
Duncan(0.05)	(35)	(35)	(35)																						
(3)																									
Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 9/24/87																									

Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 9/24/87

Table 4. Results of South Fork White Variety Experiment, Watermill, NY-1987

Standard Variety: Katahdin																			
Clone	Yield (cwt/A)			% of		% of Total Yield			Internal defects					Tuber Data				Comments	
	US No1		Std	2-4"	2-	>4	Def	Mat	Vine	HH	BC	SI	Int Nec		App	Color	Text Shape		
	Total	2-4"	2-4"										M	S			Color		Text
Katahdin	428	392	100		91	0	2	7.0		0	0	0	0	0	7.0	W	S	R	SF,(S)
Hudson	370	294	75		80	2	7	5.0		0	0	4	0	0	6.3	BU	RS	R	MT,(S,Rh)
Superior	261	225	57		86	0	4	1.3		0	0	1	0	0	7.0	BU	N	O-R	MT(S)
NY72	387	331	84		86	1	3	6.7		0	0	1	0	0	7.0	BU	N	R	R(S)
NY76	352	263	67		75	0	2	2.7		0	0	1	0	0	7.3	W	RS	R	MT,Sm(S)
NY79	312	272	69		87	0	2	2.0		0	0	1	0	0	6.7	BU	SN	R	R(S)
NY81	475	410	105		86	5	3	7.0		1	0	0	0	0	6.3	BU	SN	R	MT(S)
Waller-																			
Duncan(.05) (ns)																			
Planted 5/1/87; maturity rated 8/24/87; harvested 10/20/87																			

Long Island Table 5. The performance of Chieftain and D191-2 on Long Island. Riverhead, NY-1987

Standard Variety : Chieftain																								
Clone	Yield (cwt/A)		% of		% of Total Yield						Internal defects						Tuber Data				Comments			
	US No1	Std	2-4"	2-5"	2.5	3.3	3.3	4	3.3-	>4	Spec Vine			HH	BC	Int Nec			App	Color		Text	Shape	Depth
											Def	Grav	Mat			SI	M	S						
Chieftain	502	445	100		19	66	3	0	4	65	3.8	0	0	1	0	0	0	0	6.8	R	S	O-R	S	Some SK
D191-2	475	388	87		21	59	2	0	9	58	3.5	0	0	0	0	0	0	7.0	R-DR	S	O-R	S		
Waller-																								
Duncan(0.05) (ns) (1)																								
Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 10/15/87																								

Long Island Table 6. Results of South Fork Russet Experiment, Watermill, NY-1987

Standard Variety: BelRus																			
Clone	Yield (cwt/A)				% of Total Yield				Internal Defects					Tuber Data				Comments	
	Total	US No1		Std	4 -			Vine	HH	BC	SI	Int Nec		App	Color	Text	Shape		Depth
		4-16	16-32		32-64	64-128	M					S							
BelRus	267	138	100	52	13	2	1.0	0	1	0	0	0	0	7.0	B	HR	L	S	MT,(S)
NemaRus	324	131	95	41	36	3	2.7	1	0	1	0	0	0	7.3	B	HR	O-L	S	R,(M)
NorKing	320	165	120	52	17	3	4.0	0	0	1	0	0	0	7.0	B	MR	L	S	MT,(M)
B9596-2	349	185	133	53	15	3	2.3	0	0	0	0	0	0	7.7	B	LR	L	S	R,(MT)
Waller-																			
Duncan(0.05) (43) (ns)																			
Planted 5/1/87; maturity rated 8/24/87; harvested 10/20/87																			

Long Island Table 7. Results of NE107 Russet Experiment, Riverhead, NY-1987

Standard Variety : Bel Rus

Standard Variety : Bel Rus																						
Clone	Yield (cwt/A)			% of Total Yield							Internal Defects					Tuber Data				Comments		
	Total	US No1		Std	4 - 8	8 - 12	12 - 16	>16	Def	Spec Grav	Vine Mat	HH	BC	SI	M	S	App	Color	Text		Shape	Depth
		4-16	4-16																			
Clone	Total	4-16	4-16	Std	4 - 8	8 - 12	12 - 16	>16	Def	Spec Grav	Vine Mat	HH	BC	SI	M	S	App	Color	Text	Shape	Depth	
BelRus	198	141	100	47	22	2	1	3	72	1.8	2	0	1	0	0	0	7.5	B	H-MR	L	S	SI F(M)
NemaRus	325	236	167	40	24	9	3	6	74	2.0	5	0	1	0	0	0	7.0	B	MR	L	S	(M)
NorKing	324	231	163	43	21	6	1	7	77	2.5	12	0	2	1	0	0	6.3	B	MR	L	S	(L)
R Burbank	500	292	207	34	19	5	1	28	82	6.0	5	0	1	2	0	0	3.8	B-T	M-LR	L-C	I	Irr(Kn)
R Norfolk	373	245	174	31	23	11	6	13	70	1.8	6	0	0	0	0	0	6.3	B	MR	L	S	Irr(L)
A72685-2	520	378	268	34	26	12	5	11	87	8.0	11	0	0	0	0	0	6.0	B	MR	L	S	SI Irr(M)
AF522-5	401	297	211	44	24	7	1	5	85	3.3	3	7	6	5	1	1	6.8	B	M-HR	L-O	S	SI Irr(M)
B9596-2	417	334	236	46	25	9	2	4	66	2.8	0	0	4	6	0	0	8.3	B-T	L-MR	L	S	(M)

Waller-

Duncan(0.05) (47) (64)

(4)

Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 9/24/87

Long Island Table 8. Results of U.S.D.A. Russet Experiment, Riverhead, NY -1987

Standard Variety : BelRus

Standard Variety : Belrus	Yield (cwt/A)																			% of Total Yield										Internal defects					Tuber Data				Comments
	US No1			Std			4 -		8 -		12 -		16 -		>16		Def	Spec Grav	Vine Mat	HH	BC	SI	M	S	App	Color	Text	Shape	Depth										
	Total	4-16	17-5	4-16	100	55	18	2	0	4	72	2.8	2.8	1	0	0														0	0	7.0	B	HR	L	S			
																	407	325	186	36	33	12	3	8	73	2.5	2.5	22	0								0	1	
Clone	Total	4-16	17-5	4-16	100	55	18	2	0	4	72	2.8	2.8	1	0	0														0	0	7.0	B	HR	L	S			
BelRus	233	175	100	55	18	2	0	4	72	2.8	2.8	1	0	0	0	0	0	0	7.0	B	HR	L	S	SF															
NemaRus	407	325	186	36	33	12	3	8	73	2.5	2.5	22	0	0	1	0	0	6.8	B	MR	L-O	S	SI F																
BOO42-16	284	186	107	46	19	1	0	11	70	2.0	2.0	0	0	1	0	0	0	7.3	B	MR	L	S																	
B0184-26	366	267	153	43	23	7	2	9	81	2.5	2.5	10	1	0	0	0	0	7.0	B	MR	L	S																	
B0190-2	559	370	212	30	24	12	2	25	80	7.5	7.5	0	0	4	0	0	0	4.0	T	LR	L	S	Irr																
B9596-2	433	364	208	41	34	10	5	3	66	3.0	3.0	1	1	0	3	2	0	7.0	B	MR	L	S	SI F																
B9922-11	516	369	211	27	30	15	11	3	84	7.8	7.8	19	0	0	0	0	0	7.0	B	MR	L-O	S	SI Irr																
Waller-																																							
Duncan (0.05)	(48)																																						

Waller-

Duncan (0.05) (48) (42)

(3)

Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 10/15/87



Long Island Table 9. The effect of nitrogen rate and in-row spacing on yield and quality of NY72, NY78, NY79, NY81 and B9596-2, Riverhead, NY-1987  
Standard Treatment : 160 lbs N/A-9"

N Rate	NY72				NY78				NY79				NY81				B9596-2			
	Yield (cwt/A)				Yield (cwt/A)				Yield (cwt/A)				Yield (cwt/A)				Yield (cwt/A)			
	US No 1				US No 1				US No 1				US No 1				US No 1			
	Total	2-4"	Spec Grav	Spec Grav	Total	2-4"	Spec Grav	Spec Grav	Total	2-4"	Spec Grav	Spec Grav	Total	2-4"	Spec Grav	Spec Grav	Total	2-4"	Spec Grav	Spec Grav
160	469	410	80		542	459	67		388	315	62		555	491	75		403	334	62	
190	495	424	81		534	462	67		396	307	61		546	479	75		407	325	62	
220	496	434	79		548	469	67		408	306	63		586	519	74		427	352	63	
Spacing																				
9"	503	438	80	9"	559	476	67	6"	410	318	62	6"	595	523	75	9"	421	349	63	
12"	471	408	79	12"	524	450	66	9"	368	301	62	9"	529	470	74	12"	404	326	62	
Significance Level																				
N Rate	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)
Spacing	(0.01)	(0.05)	(ns)	(ns)	(0.05)	(ns)	(ns)	(ns)	(0.05)	(ns)	(ns)	(ns)	(0.05)	(0.05)	(ns)	(ns)	(ns)	(0.05)	(ns)	(ns)
N x Spacing	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)

Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 9/30/87

Long Island Table 10. The effect of seed piece size on yield and size distribution of Hampton potatoes, Riverhead NY-1987

Seed Size (oz)	Yield (cwt/A)				Mean Tubers				% of Total Yield				Internal Defects					
	US No 1				Per				2 - 2.5 - 3.3 - 4				Int Nec					
	Wt.(oz)				Foot				2.5 3.3 4				HH BC SL M S App					
	Total	2-4"	Spec Grav	Vine Mat	Total	2-4"	Spec Grav	Vine Mat	Total	2-4"	Spec Grav	Vine Mat	HH	BC	SL	M	S	App
1.0	413	369	7.3	5.8	15	62	12	1	4	67	7.3		3	1	1	0	0	6.5
1.5	415	347	6.6	6.7	18	56	10	3	5	68	5.8		3	3	3	1	1	6.8
2.0	425	373	6.1	7.3	21	60	7	0	4	67	5.8		6	6	7	0	1	6.5
2.5	474	397	6.7	7.4	17	60	7	1	6	65	5.5		4	4	2	0	0	6.8
Waller-																		
Duncan(0.05) (ns) (ns) (1.4)																		
Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 10/15/87																		

Planted 4/10/87; maturity rated 9/4/87; vine killed 9/10/87; harvested 10/15/87

Long Island Table 11. After-cooking darkening and blackspot ratings of clones grown in 1986<sup>1</sup>.

NE 107 White			Advanced GN			NE107 Russet			USDA Russet		
Clone	Rating ACD BS		Clone	Rating ACD BS		Clone	Rating ACD BS		Clone	Rating ACD BS	
Katahdin	4.5	0.3	Katahdin	4.8	0.5	BelRus	5.0	0.5	BelRus	4.7	0.0
Hampton	4.8	0.0	Superior	4.9	0.8	NemaRus	3.8	2.0	NemaRus	3.9	1.5
Hudson	4.6	0.3	B9581-10	4.9	0.0	NorKing	4.5	0.5	B0042-15	4.3	0.0
Shepody	4.7	2.0	B9792-53	4.7	1.0	Shepody	4.6	0.8	B0045-12	4.7	1.8
AF236-1	4.8	0.0	B9792-136	4.5	0.0	Tolaas	4.6	0.0	B9391-2	4.1	2.3
AF474-2	4.4	0.0	NY 64	4.9	0.0	A7411-2	4.4	6.0	B9596-2	4.1	0.8
CF7679-15	4.5	0.0	NY 72	4.6	0.0	A72685-2	4.5	1.5			
CS7639-1	4.8	0.5	NY 77	4.7	1.3	A75188-3	5.0	0.3			
F74123	4.6	0.3	NY 78	4.8	0.5	AF522-1	4.3	0.3			
NY 71	4.3	0.0	NY 79	4.9	0.3	B9540-55	4.6	1.0			
NY 72	4.3	0.3	NY 80	4.6	0.0	B9569-2	4.3	1.3			
NY 76	4.8	0.3	NY 81	4.9	0.3	B9596-2	4.3	0.5			
NY 81	4.6	4.8				B9922-11	4.6	1.0			
						ND534-4	4.7	0.3			
						W752	5.0	1.0			
Waller-Duncan	(0.05)	(ns) (ns)		(0.3)	(ns)		(0.4)	(ns)		(0.4)	(ns)

1 For yield data see VC Report 347, 1986, Long Island Potato Variety Trial Results.

After-cooking darkening (ACD) Ratings based on a scale of 1 to 5; 5 = no darkening, 1 = severe after cooking darkening. Five tubers rated per replication; four replications in each experiment.

Blackspot (BS) determinations are based on five tubers per replication. Tubers were stored at 40° F and bruised on 3/24/87. Bruised areas were peeled and evaluated on 3/26/87. Each tuber received a blow in each of two locations about 1 to 2 cm from the stem end. The bruising was done by dropping a 100 gram weight a distance of 30 cm. The point of impact was marked by inking the base of the weight. Ratings are based on a scale of 0 to 5 with 5 = no discoloration and 0 = severe discoloration.



## NEW YORK - UPSTATE

D. E. Halseth and W. L. Hymes

### Program Scope

The Vegetable Crops Department, Cornell University, conducted fifteen replicated variety trials distributed across five counties in upstate New York in 1987 in which a total of twenty named varieties and sixty breeding lines were evaluated. Only data from the Thompson Vegetable Research Farm at Freeville, Tompkins County, is included in this report. Additional information on grower trials as well as storage and chipping research can be obtained from the authors.

### Research Farm

All 75 entries mentioned above were evaluated in randomized complete block plots which were replicated four times. The variety trials were planted at 9" spacing on a 34" bed with 1200 lbs/acre of 13-13-13 granular fertilizer applied in bands at planting. The nitrogen rate study had four N-rates (100, 150, 200 and 250 lb/a) with P205 and K20 both held at 300 lb/a. Soil type was a Howard gravelly loam soil with a pH of 5.1 to 5.9 and organic levels of 3.0 to 3.5%. Weed control consisted of Lorox 4L at 1.5 qt/a sprayed preemergence on 5/14 and a postemergence application of Lexone 75 DF at 0.2 lb/a on 6/24. Vine killing utilized Evik 80WP at 3 lb/a (+2 qt/a Booster + E) alone or with Diquat 2S at 1 pt/a (+8 oz X-77/a). Specific gravity was determined by hydrometer.

### Seasonal Observations

Weather conditions were relatively dry for the planting season with only 2.23 inches of rainfall in May. Moisture levels were nearly normal for the rest of the growing season. Supplemental irrigation was applied when needed. No significant problems were observed in the trials except that control of the Colorado potato beetle is becoming much more difficult.

### Promising Clones and Varieties

In the early maturity trial ND 860-2 again is the poorest yielder but with the best chip color. NY79 had good early yield, chip color and tuber appearance. F70021 had yield equal to Superior but fried very dark. Midseason entries had a broad range of yield responses, with Donna the only named variety that had a higher marketable yield than the standard Katahdin. The late maturity trial showed excellent yield potential, with six entries averaging 454 and 401 cwt/a for total and marketable yields. NY81 continues to demonstrate its high yield and gravity capability as well as good tuber size. Russet entries also displayed a wide yield spectrum, but none exceeded the total yield of Russet Burbank. However, B9596-2 had a higher marketable yield and appearance rating than the standard. Of the 23 GN resistant breeding lines tested from the Cornell breeding program, eight had marketable yields above Katahdin and 18 had marketable yields higher than Monona. The french fry variety trial had the highest overall total yield average at 470

cwt/a. AF236-1 and Shepody had the highest marketable yield. Lemhi, followed closely by A72685-2, had the highest amount of hollow heart of any entry. Results from the nitrogen fertilization study show significant differences only for total yield and vine maturity due to N-rate. No significant differences were found for marketable yield, tuber number, average tuber weight or specific gravity.

Table Headings  
Explanation

Sizes used for marketable yield of indicated potato types are:  
White: 1-7/8" to 4" in dia., Russet: 4 to 16 ounces.

Percent of total yield is the weight of a specific size category divided by total yield (including defects). The letter codes for the various sizes correspond to the following parameters:

White Clones:

A = less than 1-7/8" in diameter  
B = 1-7/8" to 2-1/2"  
C = 2-1/2" to 3-1/4"  
D = 3-1/4" to 4"  
E = over 4"

Russet Clones

A = less than 4 ounces  
B = 4 to 8 ounces  
C = 8 to 12 ounces  
D = 12 to 16 ounces  
E = over 16 ounces

External defects (EXT DEF) is comprised of four classes of defects: G = green C = growth crack  
K = excessively knobby, misshapen R = rot

If a class of external defect exceeds 5% of the total yield, the appropriate defect letter code is placed next to the external defect percentage.

Internal defects (INT DEF) represents the number of tubers examined out of 40 which when cut in half showed significant symptoms of the three following defects:

H = hollow heart  
V = vascular discoloration  
N = internal necrosis

Specific gravity (SPEC GRAV), determined by hydrometer, is reported with the "1.0" digits omitted.

General external appearance (GEN APP) was subjectively evaluated using the following scale:

1 = extremely rough or otherwise unattractive  
9 = very smooth and otherwise attractive

Vine maturity ratings (VINE MAT) were also subjectively evaluated. These ratings, which were made just a day or two prior to vine killing, were based on the scale:

1 = all plants completely dead (very early)  
9 = all plants full green (very late)

UPSTATE NEW YORK TABLE 1. EARLY MATURITY VARIETY TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	YIELD(CWT/A)		% SUP YIELD		PCT OF TOTAL YIELD						YIELD		TUBER		AVG		INT		SPEC GRAV	TUBER APP.	VINE MAT.		
	TOTAL	MKT	MKT	MKT	A	B	C	D	E	EXT		NO/FT	WT(OZ)	DEF		H	V	N					
										DEF	EXT			DEF	H							V	N
B9988-7	353	326	110	3	14	58	21	4	1	1	0	6.5	5.7	0	0	0	0	0	90	4.3	8.3		
NY79	328	312	105	3	12	61	23	1	0	0	0	6.3	5.5	0	0	0	0	0	75	6.3	6.5		
NORCHIP	336	303	102	8	25	57	9	0	2	2	0	8.0	4.4	0	0	0	0	0	87	6.3	8.0		
SUPERIOR	325	296	100	5	18	67	6	1	3	3	0	7.0	4.8	0	0	1	80	4.0	5.5	5.5			
F70021	326	294	99	6	24	55	12	2	1	1	0	7.3	4.6	0	0	0	74	4.5	6.0	6.0			
B9955-46	297	276	93	3	15	60	18	1	3	3	0	5.7	5.4	0	0	0	84	5.5	8.0	8.0			
B9955-18	274	253	85	4	14	61	17	2	2	2	0	5.7	5.0	4	0	0	92	5.3	8.3	8.3			
C-1-884	309	248	84	20	57	22	1	0	0	0	0	10.6	3.0	0	0	10	82	7.0	4.8	4.8			
ND860-2	275	242	82	11	35	49	4	0	1	1	0	7.6	3.8	0	0	0	84	6.0	3.5	3.5			
WALLER-DUNCAN																							
MSD (.05)	24	18										0.82	0.56						2.8				
C.V. (%)	(5)	(5)										(9)	(8)						(3)				

PLANT DATE - APRIL 30  
VINE KILL DATE - AUGUST 13 (MOWED)  
HARVEST DATE - AUGUST 14

UPSTATE NEW YORK TABLE 2. MEDIUM MATURITY VARIETY TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	YIELD(CWT/A)		% KAT	PCT OF TOTAL YIELD					TUBER		AVG	INT			SPEC GRAV	TUBER APP.	VINE MAT.	
	TOTAL	MKT	YIELD MKT	A	B	C	D	E	EXT DEF	NO/FT	TUBER WT(OZ)	DEF						
												H	V	N				
B0241-8	428	401	123	4	15	62	17	1	1	8.8	5.1	3	0	0	85	6.0	7.5	
DONNA	418	354	109	6	20	47	18	5	4	9.1	4.8	0	0	11	75	4.3	5.8	
B0238-4	391	352	108	6	17	58	15	1	3	8.6	4.7	1	0	2	82	5.0	7.5	
B0257-3	372	329	101	9	25	57	7	0	2	10.1	3.8	0	0	0	96	6.5	6.8	
KATAHDIN	363	326	100	3	12	58	20	3	4	6.6	5.7	5	0	0	74	4.0	8.0	
ATLANTIC	353	324	100	6	20	56	16	1	2	7.9	4.7	4	0	2	94	4.8	7.0	
B0244-6	361	322	99	10	27	52	10	0	1	9.6	3.9	6	0	1	85	4.8	6.8	
KENNEBEC	398	316	97	2	12	49	18	8	10	6.4	6.5	0	0	2	77	3.3	6.3	
B0237-9	302	279	86	7	29	60	4	0	0	8.4	3.7	1	0	0	75	7.0	2.8	
MONONA	304	277	85	8	24	56	10	0	1	6.8	4.7	0	0	1	72	4.3	6.5	
B0243-11	298	273	84	3	9	64	19	4	1	5.5	5.7	1	0	0	79	5.5	6.8	
A474-2	228	194	60	5	18	50	17	5	5	4.4	5.3	0	0	0	77	4.5	7.3	
WALLER-DUNCAN																		
MSD (.05)	37	32		0.82										0.58	1.9			
C.V. (%)	(8)	(8)		(8)										(9)	(2)			

PLANT DATE - APRIL 30  
 VINE KILL DATE - AUGUST 20  
 HARVEST DATE - SEPTEMBER 1

UPSTATE NEW YORK TABLE 3. LATE MATURITY VARIETY TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	YIELD(CWT/A)		% KAT		PCT OF TOTAL YIELD										YIELD		TUBER NO/FT	AVG TUBER WT(OZ)	INT			SPEC GRAV	TUBER APP.	VINE MAT.
	TOTAL	MKT	MKT	YIELD	MKT					EXT					DEF	H			V	N				
					A	B	C	D	E	DEF	DEF	H	V	N										
NY81	531	459	121	121	2	7	40	40	9	2	2	2	2	7.2	7.8	2	0	0	81	5.5	7.3			
CS7635-4	468	427	112	112	2	8	43	40	4	3	3	3	3	6.9	7.2	0	0	0	76	5.0	7.5			
MS700-70	471	423	111	111	2	8	51	31	5	4	4	4	4	7.4	6.6	0	0	2	84	4.8	8.0			
B9792-157	429	404	106	106	4	13	52	29	0	1	1	1	1	7.8	5.7	2	0	0	82	3.5	6.3			
NY76	440	403	106	106	6	19	55	18	1	1	1	1	1	9.4	4.9	0	0	0	71	5.5	4.0			
NY72	455	387	102	102	3	11	40	34	7	5	5	5	5	7.0	6.8	1	0	0	81	5.0	7.0			
KATAHDIN	427	381	100	100	2	10	52	27	5	3	3	3	3	7.0	6.4	1	0	0	73	4.5	6.8			
ELBA	455	364	96	96	2	7	34	38	12	6	6	6	6	6.1	7.7	1	0	0	77	4.8	9.0			
NY71	402	347	91	91	4	11	42	33	4	5	5	5	5	6.9	6.1	0	0	0	75	5.0	6.0			
WALLER-DUNCAN																								
MSD (.05)	54	56												1.04	0.84				3.1					
C.V. (%)	(8)	(9)												(10)	(9)				(3)					

PLANT DATE - MAY 1  
VINE KILL DATES - SEPTEMBER 1 AND 9  
HARVEST DATE - SEPTEMBER 15

UPSTATE NEW YORK TABLE 4. RUSSET VARIETY TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	YIELD(CWT/A)		%RB YIELD	PCT OF TOTAL YIELD					YIELD		AVG TUBER NO/FT	TUBER WT(OZ)	INT			TUBER APP.	VINE MAT.
	TOTAL	MKT 4-16oz		MKT		MKT			EXT DEF	H			V	N			
			MKT	YIELD	A	B	C	D			E						
B9596-2	423	346	107	14	38	35	8	2	2	7.1	6.2	0	0	0	75	5.0	6.0
30045-6	439	336	104	20	50	19	8	1	2	8.2	5.6	2	0	0	82	6.0	5.0
RUS BURBANK	488	324	100	21	38	21	7	4	9	9.0	5.6	4	0	0	86	3.8	7.5
AF522-1	414	304	94	20	40	26	8	2	6	7.8	5.5	0	0	0	83	3.8	5.5
B0036-6	399	299	92	15	41	22	12	7	3	6.7	6.2	0	0	0	74	5.5	4.8
B9922-11	358	274	84	9	37	28	12	10	4	5.3	7.1	11	0	0	87	6.5	7.8
A75188-3	433	265	82	17	27	29	5	5	17	7.6	5.9	0	0	0	78	3.0	8.5
NEMARUS	329	259	80	18	31	39	9	2	2	5.8	5.9	0	0	0	74	5.3	5.3
B9569-2	301	223	69	24	48	22	4	1	2	6.1	5.1	0	0	0	78	6.3	3.0
AF522-5	263	175	54	31	49	15	2	0	3	6.3	4.4	2	0	6	88	5.5	5.0
AF465-2	289	165	51	42	42	11	3	0	1	7.8	3.9	7	0	0	80	4.0	3.8
BELRUS	255	141	43	43	39	15	2	1	0	6.8	3.9	0	0	0	81	6.8	4.3
WALLER-DUNCAN																	
MSD (.05)	46	41								0.97	0.53				3.3		
C.V. (%)	(9)	(12)								(10)	(7)				(3)		

PLANT DATE - MAY 1  
 VINE KILL DATES - SEPTEMBER 1 AND 9  
 HARVEST DATE - SEPTEMBER 15



UPSTATE NEW YORK TABLE 5. CORNELL ADVANCED CLONES TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	CLASS	YIELD(CWT/A)		% KAT		PCT OF TOTAL YIELD					TUBER		AVG		INT			SPEC		TUBER		VINE	
		TOTAL	MKT	YIELD	MKT	MKT					EXT	DEF	#/FT	WT(OZ)	TUBER	WT(OZ)	DEF			GRAV	APP.	VINE	MAT.
						A	B	C	D	E							H	V	N				
D191-2	RED	570	478	134	134	2	7	42	34	9	5	8.3	7.3	7.3	0	0	0	68	5.8	5.8	5.5		
E57-22	WHI	499	450	126	126	2	10	49	31	2	6	8.6	6.1	6.1	0	0	0	71	4.8	4.8	4.8		
D146-11	WHI	556	446	125	125	2	6	35	39	11	6	7.9	7.4	7.4	0	0	0	74	5.0	5.0	6.5		
E11-45	WHI	474	407	114	114	2	8	53	24	7	6	7.7	6.5	6.5	0	0	0	74	5.5	5.5	7.0		
NY81	WHI	503	406	114	114	2	6	41	34	9	8	7.0	7.5	7.5	2	0	0	84	4.5	4.5	7.8		
E55-27	WHI	423	380	106	106	4	15	47	28	3	3	7.9	5.6	5.6	0	0	0	87	5.3	5.3	4.3		
E57-13	WHI	441	369	103	103	3	10	46	27	6	8	7.7	5.9	5.9	8	0	0	80	5.2	5.2	3.7		
E55-35	WHI	411	360	101	101	4	15	45	27	2	7	7.8	5.5	5.5	1	0	0	91	5.0	5.0	7.0		
KATAHDIN	WHI	491	357	100	100	2	3	37	32	13	13	6.5	7.9	7.9	9	0	0	80	4.0	4.0	6.5		
NY78	WHI	411	354	99	99	2	6	52	28	3	8	6.7	6.4	6.4	0	1	1	74	6.0	6.0	8.0		
NY72	WHI	500	350	98	98	1	5	30	35	13	17	6.6	7.9	7.9	2	1	0	88	4.8	4.8	7.3		
E11-18	WHI	393	348	97	97	5	24	47	18	2	4	8.7	4.7	4.7	1	0	0	73	4.5	4.5	3.5		
D164-9	WHI	395	342	96	96	5	14	53	19	3	6	8.1	5.1	5.1	2	3	0	85	5.3	5.3	3.3		
D195-24	WHI	409	340	95	95	3	14	47	22	4	9	7.5	5.6	5.6	0	1	0	97	5.3	5.3	5.0		
D147-9	WHI	391	328	92	92	5	12	44	28	4	7	7.3	5.6	5.6	0	1	1	76	4.8	4.8	4.8		

(Continued, next page)

UPSTATE NEW YORK TABLE 5. (Continued) CORNELL ADVANCED CLONES TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	CLASS	YIELD(CWT/A)		% KAT		PCT OF TOTAL YIELD					TUBER		AVG		INT			SPEC		TUBER		VINE	
		TOTAL	MKT	MKT	YIELD	MKT					EXT	#/FT	WT(OZ)	DEF			GRAV	APP.	MAT.				
						A	B	C	D	E				DEF	H	V				N			
E28-2	WHI	426	317	89	2	7	32	36	13	11	G	5.9	7.5	5	0	0	87	4.9	5.8				
E57-1	WHI	436	313	88	2	4	40	27	12	14	G	6.3	7.2	0	0	0	77	5.6	3.3				
E57-9	WHI	340	312	87	3	14	56	22	0	5	G	6.7	5.3	3	0	0	80	5.4	4.0				
NY71	WHI	415	306	86	1	6	32	35	19	6		5.4	8.1	0	2	0	81	4.3	5.0				
MONONA	WHI	355	299	84	2	11	51	23	9	4		5.5	6.8	0	0	0	72	3.3	5.8				
F143-1	RUS	392	296	83	13	30	31	14	4	8	G	6.5	6.3	7	0	1	82	4.5	7.3				
NY79	WHI	384	296	83	2	4	28	45	14	7	G	4.5	8.9	0	0	0	70	5.8	4.3				
D183-2	WHI	353	291	81	2	9	44	29	7	9	G	5.2	7.0	0	1	0	75	5.0	5.8				
E40-10	WHI	356	280	78	2	6	39	34	10	9	G	5.2	7.1	0	0	0	68	5.8	5.0				
E55-44	WHI	311	269	75	2	11	51	26	8	3		5.0	6.4	4	0	0	86	6.3	3.8				
WALLER-DUNCAN																							
MSD (.05)		45	44									0.83	0.65				2.7						
C.V. (%)		(8)	(9)									(10)	(8)				(3)						

PLANT DATE - MAY 8  
VINE KILL DATE - SEPTEMBER 10  
HARVEST DATE - OCTOBER 13-14

UPSTATE NEW YORK TABLE 6. FRENCH FRY PROCESSING VARIETY TRIAL, FREEVILLE, NEW YORK, 1987

VARIETY OR CLONE	CLASS	YIELD(CWT/A)		%RB YIELD	PCT OF TOTAL YIELD*					TUBER NO/FT	AVG TUBER WT(OZ)	INT DEF			SPEC GRAV	VINE MAT.			
		TOTAL	4-16oz		MKT	A	B	C	D			E	EXT	DEF			H	V	N
LA01-38	WHI	548	456	122	8	37	33	13	7	2	8.2	7.0	2	0	0	79	7.5		
PENN71	WHI	524	424	113	11	39	32	10	4	4	7.6	7.3	15	0	0	69	7.3		
LEMHI	RUS	563	399	106	20	36	22	13	6	4	9.7	6.1	18	0	1	85	7.8		
B7592-1	WHI	506	384	102	9	35	26	14	11	4	7.1	7.5	1	0	0	75	8.3		
AF236-1	WHI	552	377	100	9	28	22	18	13	10	7.1	8.2	2	0	4	79	7.5		
SHEPODY	WHI	497	376	100	9	32	28	16	12	4	7.4	7.0	5	0	1	82	7.3		
RUS BURBANK	RUS	515	375	100	20	42	20	11	3	4	10.2	5.3	1	0	0	81	8.5		
A72685-2	RUS	526	368	98	14	33	25	12	11	5	8.4	6.5	17	0	0	85	9.0		
NORKING RUS	RUS	451	354	94	17	40	25	14	5	0	7.9	6.0	7	0	2	80	5.5		
RUS NORKOTAH	RUS	473	334	89	14	34	22	15	12	4	7.2	6.9	1	0	0	70	5.5		
KENNEBEC	WHI	498	325	87	8	23	24	19	19	8	5.8	9.0	2	0	1	73	7.8		
FL657	WHI	349	296	79	14	56	20	9	1	0	6.7	5.5	0	0	2	66	5.5		
NOOKSACK	RUS	369	279	74	12	35	26	15	8	4	6.0	6.4	3	0	0	84	8.3		
A7411-2	RUS	322	215	57	9	28	25	14	22	2	4.5	7.5	5	0	1	84	8.8		
YANKEE CHIP	WHI	341	184	49	42	42	9	2	0	4	8.9	4.0	0	0	0	81	6.0		
ISLANDER	WHI	299	183	49	23	33	21	8	2	13	5.9	5.4	16	0	0	71	6.8		
WALLER-DUNCAN																			
MSD (.05)		55	44								1.18	0.97				2.5			
C.V. (%)		(9)	(10)								(12)	(11)				(3)			

\* PERCENT EXTERNAL DEFECTS DOES NOT INCLUDE KNOBS OR GROWTH CRACKS. THIS TRIAL WAS NOT CULLED FOR THOSE CLASSES OF DEFECT.

PLANT DATE - MAY 1  
VINE KILL DATES - SEPTEMBER 1 AND 9  
HARVEST DATE - SEPTEMBER 25

UPSTATE NEW YORK TABLE 7. NITROGEN FERTILIZATION FRENCH FRY PROCESSING TRIAL,  
FREEVILLE, NEW YORK 1987

VARIETY	NITROGEN YIELD(CWT/A)		PCT OF TOTAL YIELD					AVG		INT		SPEC GRAV	VINE MAT.			
	RATE (LB/A)	TOTAL	MKT		EXT			TUBER NO/FT	TUBER WT(OZ)	DEF	H V N					
			4-16oz	A	B	C	D							E	DEF	
B7592-1	100	453	332	20	45	21	7	3	4	7.4	6.9	0	0	0	74	5.5
B7592-1	150	480	340	15	39	21	11	5	9 G	6.9	7.5	0	0	0	74	6.8
B7592-1	200	467	337	17	36	26	10	6	6 G	7.7	6.4	0	0	0	74	7.5
B7592-1	250	494	355	13	35	25	12	7	8 G	8.0	6.5	0	0	0	73	8.3
NORKING RUS	100	319	224	27	50	18	2	1	2	6.6	5.2	7	0	1	73	2.0
NORKING RUS	150	337	241	25	47	18	6	1	2	7.3	4.9	6	0	1	75	4.0
NORKING RUS	200	325	221	27	39	23	6	2	3	6.7	5.1	5	0	1	76	4.5
NORKING RUS	250	366	260	19	39	21	11	4	6	6.8	5.6	3	0	1	75	6.0
SHEPODY	100	358	246	21	42	21	6	2	8 G	6.6	5.6	3	0	1	80	3.3
SHEPODY	150	390	257	17	38	20	7	4	13 G	6.0	7.1	3	0	0	78	5.3
SHEPODY	200	471	302	9	30	22	12	10	17 G	5.9	8.3	2	0	0	78	7.0
SHEPODY	250	463	295	9	28	24	12	8	19 G	6.1	8.0	5	0	0	77	8.0
YANKEE CHIP	100	346	162	50	42	5	1	0	2	11.1	3.2	0	0	0	77	3.0
YANKEE CHIP	150	374	191	44	42	8	1	0	5	10.2	3.8	1	0	0	81	4.5
YANKEE CHIP	200	411	193	45	38	7	2	1	7 G	10.1	4.3	0	0	0	81	5.3
YANKEE CHIP	250	385	214	39	45	8	3	0	5	9.9	4.1	0	0	0	82	6.0

WALLER-DUNCAN MSD (.05) IS GIVEN FOR THE MAIN EFFECTS OF NITROGEN RATE AND VARIETY.  
SIGNIFICANCE LEVELS FOR THE NITROGEN RATE X VARIETY INTERACTION ARE: \* = 5%,  
NS = NOT SIGNIFICANT AT THE 5% LEVEL.

SOURCE OF VARIATION		TOTAL		MKT		TUBER		AVG		SPEC		VINE MAT.
		YIELD	YIELD	YIELD	NO/FT	NO/FT	WT(OZ)	TUBER WT(OZ)	GRAV	GRAV	VINE MAT.	
NITROGEN RATE		43	NS	NS	NS	NS	NS	NS	NS	NS	1.4	
VARIETY		21	19	0.6	0.6	0.6	0.6	0.6	1	0.55	0.55	
NIT. RATE X VARIETY		*	NS	NS	NS	NS	NS	NS	*	NS	NS	
C.V. (%) - NIT. RATE		(12)	(19)	(14)	(14)	(14)	(27)	(27)	(2)	(32)	(32)	
C.V. (%) - VARIETY		(8)	(11)	(12)	(12)	(12)	(16)	(16)	(3)	(16)	(16)	

PLANT DATES - MAY 5-6 VINE KILL DATES - SEPTEMBER 1,9 HARVEST DATE - OCTOBER 2

R.L. Plaisted, H.D. Thurston, B.B. Brodie, and W.M. Tingey

Crossing and Seedling Production: Twenty-one crosses with chip potential were produced. The greatest volume of seed was NY81 x a bulk of (neotbr x tbr) hybrids. Twelve russet crosses and one red cross were made. Twenty-seven crosses were made with resistance to Globodera pallida using clones identified at CIP with resistance to P4A and P5A. In the trichome population, 146 crosses were made. Most of these were backcrosses to tuberosum clones. The multiple disease resistant population had 22 crosses of the disease resistant clones and a bulk of 14 heat tolerant neotuberosum hybrids. Thirty-one test crosses of Hudson selfed clones were made to identify triplex and quadriplex clones. Eighty-one thousand seedlings were transplanted and about 55,000 tubers harvested. Only the russetted tubers were saved in the russet crosses and the red tubers in the red crosses. Seventy-three thousand seedling hills were produced. Of these, 16,000 were for russet selections, 38,000 for chipping selections, and 18,000 were neotuberosum hybrids.

Early Generation Selections: The single hill selections from 1986 were tested for chip color from 50° storage using test tape. Five hundred ninety eight selections were saved from 3,640 that were tested. Nine hundred two single hill selections were tested for golden nematode and 674 saved. In the next two generations, there were 49 and 27 clones.

Advanced Generations: There were 15 clones in advanced yield trials. The clones selected for continued trial were NY71, NY72, NY78, NY79, NY81, NY83, and 6 "D" clones. Most have chipping potential. One is red. NY78, NY79, NY81, and D191-2 were produced under contract with a certified seed grower.



## NORTH CAROLINA

F. L. Haynes

### Breeding Program

The tetraploid breeding program, including seedling population production, clonal maintenance, selection and increase, was moved to the Mountain Horticultural Crops Research Station, Fletcher. No summer hybridization program was conducted at Fletcher because of severe weather stress, both heat and drouth.

Advance trials of selections from North Carolina, USDA and other states were conducted at four coastal locations. Results of three of these are presented in North Carolina Tables 1, 2, and 3. All coastal trials were subjected to severe heat and drouth stress, but the Pasquotank trial (Table 1) was most affected. The results of the severe weather are reflected in the higher-than-normal coefficients of variation and the generally low tuber specific gravity readings at all coastal locations. Among the early to medium early clones, ND860-2, B9792-157 and B9792-158 continued to be superior in performance. NY71 and NY81 were good at one location but not at all trial locations as had been the case in previous years. 73C26-1 was disappointing at all locations. The cultivar Sunrise continued to produce good yields at all locations.

A trial was conducted at one mountain location. The results are presented in North Carolina Table 4. NY71 and NY81 continued to perform well at this location.

### Adaptation and Diploid Breeding

Evaluation and maintenance of the adapted diploid PHU-STN population was continued at the Fletcher Station. Clones representing selections for high dry matter, early blight resistance, soft rot resistance, and heat tolerance were maintained.

The study was continued to evaluate recurrent selection for maintaining a population and improving tuber dry matter and tuber type. A segregating seedling trial representing the second cycle of selection for tuber dry matter and tuber yield was conducted. The trial consisted of 72 families, 100 segregates per family (25 seedlings x 4 replications). Selection was first on the basis of tuber yield (size and number) and secondly on evaluation for specific gravity. This trial was successful because it was grown under irrigation. A trial of the 72 parental clones was destroyed on June 2 by a 5-inch rain and overflowing creek.

The studies of resistance to early blight at both the diploid and tetraploid levels were continued. 4x hybrids with high levels of resistance combined with good tuber type and fertility are being increased for germplasm release.

Diploid clones with high levels of resistance to tuber soft rot and blackleg have been used in the hybridization program to produce resistant 4x progeny. These fertile 4x progeny are being increased for germplasm release.



Variety	US# 1A		Appearance <sup>1</sup>	Chip Color <sup>2</sup>	Specific Gravity	Maturity
	CWT/A	%				
LA01-38	199.5	91.4	7.0	63.4	1.050	Midseason
NYD147-9	194.0	86.4	7.0	72.0	1.068	Midseason
Atlantic	184.5	86.9	7.0	69.3	1.082	Medium early
Sunrise	174.3	85.8	7.0	66.5	1.078	Medium early
Neb. AB-1	169.5	81.5	7.0	63.8	1.062	Medium early
ND860-2	163.4	84.4	7.7	67.8	1.071	Medium early
NY81	159.3	87.9	7.5	66.5	1.064	Medium early
B0243-18	155.2	86.1	8.0	72.5	1.060	Medium early
MS700-83	150.4	84.1	7.7	68.8	1.072	Early
B0242-2	147.7	81.7	7.2	66.8	1.072	Medium early
NY71	147.0	88.6	7.0	71.3	1.077	Medium early
Superior	140.9	84.2	7.7	68.6	1.072	Early
ND651-9	139.6	77.4	7.5	68.6	1.074	Medium early
NYD195-11	139.6	88.3	7.5	72.2	1.074	Medium early
73C26-1	138.2	82.9	7.0	63.9	1.061	Medium early
NYD164-9	134.8	77.2	7.0	70.7	1.081	Midseason
Wauseon	127.3	87.0	7.0	66.5	1.068	Medium early
B0172-15	122.5	88.5	7.0	69.1	1.067	Medium early
B0257-8	118.5	76.7	7.5	64.5	1.063	Medium early
NYD195-16	100.8	82.0	7.2	69.6	1.074	Medium early
Norchip	99.4	78.3	6.5	68.1	1.077	Medium early
B0190-9	95.3	77.5	6.7	71.2	1.071	Medium early
B0240-11	90.5	72.3	7.0	70.9	1.074	Midseason
Nemarus	89.9	71.5	6.5	72.9	1.066	Medium early
LSD (.05)	37.4	8.0	.5			
CV (%)	18.8	6.9	5.4			

<sup>1</sup>Appearance: 1 = Very Poor, 3 = Poor, 5 = Fair, 7 = Good, 9 = Excellent.

<sup>2</sup>Agtron reading of chip color provided by Anheuser-Busch Co.

Variety	US# 1A		Appearance <sup>1</sup>	Chip Color <sup>2</sup>	Specific Gravity	Maturity
	CWT/A	%				
Sunrise	252.2	91.2	7.7	.	.	Medium early
B9792-157	236.4	91.5	7.7	.	.	Medium early
ND860-2	220.7	86.1	8.0	68.9	1.062	Medium early
B9792-158	215.7	82.5	7.0	.	.	Midseason
Atlantic	204.2	88.6	7.2	64.2	1.063	Midseason
Norchip	202.8	83.6	7.0	.	.	Medium early
B0045-6	202.1	89.5	7.7	.	.	Medium early
MS700-83	201.3	84.6	8.5	64.9	1.064	Medium early
NY81	187.7	92.3	8.5	.	.	Medium early
NY71	186.3	92.8	7.7	.	.	Midseason
NYD195-11	184.1	89.7	7.5	65.5	1.058	Medium late
73C26-1	182.7	86.9	7.5	.	.	Medium early
Superior	181.3	85.9	7.7	.	.	Medium early
76C29-7	178.4	87.7	7.0	.	.	Medium early
LA01-38	177.7	93.0	7.0	61.4	1.054	Medium early
B9792-8B	176.3	82.4	8.0	.	.	Medium early
NYD195-25	174.1	83.3	8.0	69.4	1.058	Midseason
ND651-9	172.0	83.5	7.5	.	.	Medium early
BO220-14	159.8	86.4	8.2	.	.	Medium early
Neb. AB-1	156.2	79.7	7.5	66.0	1.063	Medium early
Wauseon	154.0	90.3	7.7	.	.	Medium early
Nemarus	121.1	74.2	7.5	.	.	Medium early
B9922-11	110.3	77.8	7.5	.	.	Medium early
LSD (.05)	40.1	4.9	.6			
CV (%)	15.4	4.0	5.8			

<sup>1</sup>Appearance: 1 = Very Poor, 3 = Poor, 5 = Fair, 7 = Good, 9 = Excellent.

<sup>2</sup>Agtron reading of chip color provided by Anheuser-Busch Co.

Variety	US# 1A		Appearance <sup>1</sup>	Chip Color <sup>2</sup>	Specific Gravity	Maturity
	CWT/A	%				
ND860-2	286.6	92.0	8.0	66.6	1.056	Medium early
76C29-7	284.5	89.6	6.5	72.0	1.048	Midseason
B9792-157	282.3	88.1	7.2	68.3	1.054	Midseason
Sunrise	268.0	88.5	7.5	70.5	1.054	Medium early
Superior	264.4	93.1	7.7	67.4	1.056	Medium early
NY71	249.3	93.0	7.0	66.8	1.054	Medium
B9792-158	244.3	84.9	7.7	71.2	1.052	Medium early
81C1-10	239.3	88.4	7.0	66.0	1.064	Medium early
66CP3(75)-1	236.4	89.8	7.2	71.6	1.045	Midseason
82C25-18	236.4	86.7	7.7	69.4	1.067	Medium early
NY81	235.0	89.9	8.0	65.2	1.058	Medium early
Norchip	225.0	91.6	6.7	68.4	1.055	Medium early
BO220-14	225.0	85.1	7.0	67.5	1.053	Medium early
ND651-9	219.2	82.0	6.7	60.1	1.059	Medium early
82C21-1	215.7	88.2	7.0	62.7	1.052	Midseason
Atlantic	215.0	88.7	7.0	69.5	1.061	Midseason
73C26-1	215.0	86.5	7.7	68.2	1.060	Medium early
BO045-6	200.6	78.7	8.0	66.2	1.057	Midseason
B9922-11	166.9	86.1	7.5	68.2	1.059	Medium early
NYD195-16	166.2	80.2	6.7	63.2	1.059	Medium late
Wauseon	164.1	87.5	7.0	67.8	1.041	Midseason
Nemarus	159.8	81.8	6.5	.	.	Midseason
82C26-2	156.9	85.2	6.0	70.2	1.060	Midseason
B9792-8B	147.6	86.9	6.5	64.6	1.063	Midseason
LSD (.05)	63.7	6.6	.5			
CV (%)	20.4	5.4	5.4			

<sup>1</sup>Appearance: 1 = Very Poor, 3 = Poor, 5 = Fair, 7 = Good, 9 = Excellent.

<sup>2</sup>Agtron reading of chip color provided by Anheuser-Busch Co.

Variety	US# 1A		Appearance <sup>1</sup>	Maturity
	CWT/A	%		
NY81	344.2	91.3	8.0	Medium early
LA01-38	322.8	91.6	7.0	Midseason
NY71	287.8	93.3	7.0	Medium early
Atlantic	271.6	89.7	7.7	Medium early
Neb. AB-1	256.0	81.5	7.2	Medium early
Norchip	252.8	83.0	6.7	Early
NYD195-25	246.3	85.0	7.2	Medium early
NYD147-9	243.1	91.8	7.7	Early
NY72	239.8	86.7	7.0	Midseason
ND651-9	237.9	77.1	7.7	Medium early
MS700-83	220.4	75.0	7.0	Medium early
73C26-1	218.4	82.8	7.5	Early
NYD195-11	215.9	81.8	6.5	Medium early
Sunrise	214.6	90.2	7.0	Medium early
Superior	203.5	81.0	6.5	Early
ND860-2	177.6	84.0	7.5	Medium early
Wauseon	169.2	78.1	7.0	Medium early
Nemarus	166.6	83.2	8.0	Medium early
LSD (.05)	88.7	7.3	.7	
CV (%)	26.2	6.1	6.5	

<sup>1</sup>Appearance: 1 = Very Poor, 3 = Poor, 5 = Fair, 7 = Good, 9 = Excellent.

## **NORTH DAKOTA**

R.H. Johansen, S.H. Jansky, B. Farnsworth, and A. Thompson

### Potato Breeding Program

**Crossing and Seedling Production.** In the greenhouse 313 potato crosses were made during the spring of 1987 and during the summer approximately 45,000 seedling tubers were produced. At the Langdon Experiment Station, approximately 55,000 seedling tubers were planted in 1987 and approximately 1500 were saved at harvest for further evaluation and increase. The Langdon plot was planted on April 27th and 28th and harvested September 8th and 9th. Several thousand seedling tubers from Texas and Idaho were also planted at Grand Forks with only a few being selected at harvest.

**Advanced Selections.** At Grand Forks and Absaraka, 868 second year selections were planted and 205 were saved at harvest for further increase. This planting is done with the cooperation of the Plant Pathology Department. Of the advanced selections, 300 were planted at Grand Forks and Casselton and 167 were retained at harvest. Several selections and cultivars from other potato breeding programs throughout the U.S. and Canada were also planted at Grand Forks for evaluation and increase. The plots were planted at Grand Forks on May 11th and 12th and harvested on August 31st and September 1st. A test plot of a few promising selections was also planted at Barnesville, Minnesota.

**Promising Selections.** On March 1, 1987, ND534-4Russ was named Russet Norkotah. From all reports, this could be one of the most outstanding cultivars released by the Horticulture Department. In 1987 there were approximately 2700 acres of certified seed grown in North Dakota. Colorado, Minnesota, Wisconsin and Oregon also reported a fairly large acreage. The total certified seed of Russet Norkotah in the U.S. during 1987 was well over 5,000 acres. ND860-2, a cold chipping selection, also was grown and tested in fairly large acreages in 1987. Over 600 acres of ND860-2 certified seed was grown in North Dakota this past season. It is anticipated that a fairly large acreage of ND860-2 will be planted by chip growers in 1988.

Several other selections also looked good and are being increased by foundation seed growers. The most outstanding are NDT-9-1068-11R, ND651-9 and ND671-4Russ. A small certified seed acreage of these three selections was planted in North Dakota this past summer and a larger increase is expected next season.

NDT-9-1068-11R is a high yielding, smooth red selection that could be a replacement for Red Pontiac. ND651-9 is another good yielding chip selection that may be a long-term storage chip variety. ND671-4Russ is a russet selection adapted for

french fry use and the russet count carton trade. ND671-4Russ might have some verticillium wilt resistance. Other selections that show promise in the breeding program are ND2008-2, ND1215-1, ND1215-16, ND1538-1Russ and ND2224-5R.

**Cultivar and Selection Trials.** Trials were planted at Grand Forks, Park River, Minot and Williston. Twenty-five entries were planted at Park River while Grand Forks had twenty-seven entries. Eleven entries were planted at Minot and Williston. Roger Hanson was in charge of general maintenance of the Grand Forks trial while Wayne Grinde was in charge of the Park River trial. Personnel from the Minot and Williston Agriculture Branch Experiment Stations conducted their trials. The North Central Regional trial was again planted at Grand Forks. Planting and harvest dates of all trials are found in Table 1.

Weather and growing conditions were fairly ideal for potato production in 1987. Grand Forks had 14.4 inches of precipitation from May until harvest and Park River, although somewhat drier, had fair moisture during the season. The 1987 spring was probably one of the earliest springs on record. Minot was extremely dry until mid-July and temperatures were above average in April, May and June and slightly below or near normal the rest of the season. Williston had weather comparable to Minot during most of the season--excellent growing conditions early in the season and then a dry, hot spell in June.

In the Red River Valley trials, Red Pontiac, with an average of 282 cwt/A was the highest yielding entry in trial (Table 2). The next highest yielding entry was NDT-9-1068-11R with an average of 269 cwt/A. Yield for both of these entries was quite comparable at Grand Forks. Other high yielding entries were Super Norgold, Russet Norkotah, and ND2224-5R. There was little yield difference between the chip entries, Norchip, ND2008-2 and ND1215-1. ND860-2 and Russet Burbank were the lowest yielding entries.

In 1987, the Grand Forks trial outyielded the Park River trial by an average of 28 cwt/A. The drier season at Park River during a critical period may have accounted for this.

Some of the promising entries in trial were four reds, NDT-9-1068-11R, ND2224-5R, ND1562-4R and ND1196-2R, and two russets, ND671-4Russ and ND1538-1Russ. The red entries all had good color and yield, while the russets had good shape and appearance. The most promising white chippers were ND651-9, ND860-2, ND2008-2, ND1215-1, ND1215-16 and ND2109-7. HiLite Russet and Shepody were planted only at Grand Forks. HiLite Russet yielded similar to Russet Norkotah, but did not have as good russetting or tuber type.



Red Pontiac was the highest yielding entry at both Minot and Williston. The Minot trial outyielded the Williston trial by an average of 68 cwt/A (Table 3).

Several selections produced good yield in the advanced selection and cultivar trial (Table 4). Some of these selections not only had good yield but had good appearance and several will move up to the state-wide trial in 1988.

Because of their small size and off-type, SH-1 and Shepody had a low U.S. No. 1 yield. The low yield of these two entries may also be attributed to the fact they are late and the vines were killed early in September.

In the Red River Valley trials, several selections including ND2109-7 and ND1215-16 had total solids higher than Norchip. The total solids at Grand Forks and Park River were similar (Table 2). In the advanced selection and cultivar trial, ND986-9 with total solids of 22 percent was the highest entry.

**Processing Tests - Chipping.** Agtron readings and percent chip yield are found in Table 5. These data were obtained from the 1986 statewide potato variety trial. After harvest and grading, the samples were stored at 38°F for 2 1/2 months and then chipped immediately out of storage. The samples were then chipped every two weeks out of 65°F storage. Outstanding chippers were ND860-2, TND22-2, ND398-1, ND651-9, ND1215-1 and ND1215-16. ND860-2 and ND651-9 had the best chip color when chipped out of 38°F.

One hundred and one second year selections were tested for chip quality by the Potato Research Laboratory, East Grand Forks, MN. Samples were chipped out of 65°F storage on February 23, 1987. Thirteen selections had Agtron readings of 44 which is considered to be fairly light color. Twenty-six third year selections were chipped out of 43°F and then reconditioned at 65°F for 1 month. Several selections that had ND860-2 in their breeding chipped out of 43°F storage and had excellent chip color after reconditioning. One hundred and twenty-six fourth year and older selections were also chipped in the same manner. These selections were from the North Dakota breeding program, from other states, and named cultivars. Several showed outstanding chipping characteristics.

**Processing Tests - French Fries and Flakes.** Twenty-two selections and cultivars and the check cultivar Russet Burbank were tested for french fry color, texture and flavor by the Food and Nutrition Department of the College of Home Economics at NDSU (Table 6). The frozen french fries and the flakes were prepared by the Potato Research Laboratory at East Grand Forks, MN. Several advanced selections were as good as or better than Russet Burbank in french fry quality. Russet Norkotah and NorKing Russet were very similar to

Russet Burbank in french fry quality. Limpness in french fries was done by the Munson and Nylund limpness method. French fry length determinations were also made. This test is significant because processors of frozen french fries desire a long french fry. In the flake test Norchip scored the highest in overall quality when six selections and Norchip were tested for flakes (Table 6).

**Culinary Tests.** Advanced selections and check cultivars grown in the 1986 statewide trials were tested for both boiling and baking quality. Table 7 contains the average scores from trials at Grand Forks and Park River. Russet Norkotah, NorKing Russet and ND671-4Russ were excellent bakers. In the boiling test selections or cultivars high in total solids generally sloughed excessively after boiling. No selection or cultivar showed serious after-cooking darkening.

North Dakota Table 1. Spacing, fertilizer, soil type, planting and harvest dates of the 1987 trials.

Location	Spacing		Fertilizer	Soil Types	Planting Date	Harvest Date
	Row	Plant				
---inches---						
Park River	38	12	57-21-0 @ 200#/A	Glyndon silt loam	4/27	9/2
Grand Forks	38	12	22-22-12 @ 400#/A	Bearden clay loam	5/11	9/17
Minot	36	14	None	Williams loam	4/30	10/1
Williston	36	16-18	25#/A N + 86#/A P <sub>2</sub> O <sub>5</sub>	Loam	4/29	9/8

North Dakota Table 2. U.S. No. 1 yield, percent U.S. No. 1 and percent total solids of potato cultivars and selections grown in the Red River Valley, 1987.

Cultivar or Selection	Grand Forks				Park River				Average			
	Cwt/A		%		Cwt/A		%		Cwt/A		%	
	US No. 1 Yield	No. 1	US No. 1	Total Solids	US No. 1 Yield	No. 1	US No. 1	Total Solids	US No. 1 Yield	No. 1	US No. 1	Total Solids
Red Pontiac	272		85	18.0	293		88	17.7	282		87	17.9
NDT-9-1068-11R	265		86	17.7	273		90	18.0	269		88	17.9
Super Norgold	240		82	19.4	273		86	20.1	257		84	19.8
Russet Norkotah	261		87	19.4	232		95	19.7	246		91	19.6
ND2224-5R	286		79	19.2	199		87	19.9	243		83	19.6
ND1562-4R	255		84	18.0	208		90	17.5	231		87	17.8
ND1196-2R	286		85	18.2	173		95	18.0	230		90	18.1
ND2008-2	220		84	19.4	238		87	20.5	229		86	20.0
Norchip	241		76	20.7	211		86	21.2	226		81	21.0
ND1215-1	263		88	18.6	189		91	18.8	226		90	18.7
ND671-4Russ	224		89	19.2	222		88	19.9	223		89	19.6
ND791-5R	239		79	17.1	200		89	17.7	220		84	17.4
Kennebec	205		74	19.2	232		79	17.7	218		77	18.5
ND651-9	242		75	19.7	184		89	20.5	213		82	20.1
ND1215-16	204		81	21.2	221		82	21.4	212		82	21.3
Redsen	252		79	18.6	170		88	19.0	211		84	18.8
NorKing Russet	225		83	19.9	192		90	20.9	209		87	20.4
ND1538-1Russ	247		63	19.4	165		86	19.0	206		75	19.2
ND1483-16R	251		79	19.4	152		89	18.6	201		84	19.0
ND2109-7	240		81	20.9	153		88	23.3	196		85	22.1
ND1892-2R	231		78	17.5	161		83	18.2	196		81	17.9
ND1871-3R	207		74	18.4	171		88	19.0	189		81	18.7
Red Norland	159		86	17.3	199		74	18.0	179		80	17.7
ND860-2	144		74	19.9	116		85	20.7	130		80	20.3
Russet Burbank	92		53	19.4	156		54	18.8	124		54	19.1
Hi-lite	244		90	19.7	--		--	--	244		90	19.7
Shepody	137		62	18.6	--		--	--	137		62	18.6
Average	227		79	19.0	199		86	19.4	213		82	19.2

North Dakota Table 3. Advanced Selections and Cultivar Trial Grown at Grand Forks, ND - 1987

Selection or Cultivar	U.S. No. 1 Yield Cwt/A	Total Yield Cwt/A	% U.S. No.1	Total Solids
ND1618-13R	275	292	94	17.7
ND1408-8R	256	279	92	19.2
ND1382-6R	244	284	86	18.8
ND2354-20R	235	257	91	18.0
Norchip	226	270	84	21.4
ND1725-4	220	250	88	20.3
ND2050-1R	214	225	95	18.8
ND2225-1R	209	234	89	18.4
ND986-9	208	247	84	22.0
ND2165-8	199	234	85	19.2
Redsen	198	250	79	18.4
ND2055-3	198	218	91	20.5
ND2157-4	195	225	87	20.9
ND1384-7	194	246	79	19.9
ND2270-1R	192	176	93	17.3
Red Norland	190	222	86	17.0
NDT2-1947-5Russ	181	229	79	20.5
Super Norgold	176	212	83	18.6
ND2141-4Russ	173	212	82	17.5
ND2107-1	170	200	85	21.8
ND2158-10	170	241	70	19.0
ND1850-5Russ	162	188	86	19.9
ND2222-7	152	204	74	21.4
ND2207-8Russ	146	206	83	18.6
ND1682-2	143	188	76	20.7
ND1859-3	142	161	88	20.7
SH-1	119	196	60	17.3
Shepody	116	191	61	18.8
Average	189	226	83	19.4

North Dakota Table 4. Yield Data and Total Solids of Potato Cultivars and Selections Grown at Williston and Minot, 1987.

**WILLISTON**

Cultivar or Selection	Yield U.S. No. 1 Cwt/A	% U.S. No. 1	% Total Solids
Kennebec	182	96	23.3
Norchip	169	88	23.5
NorKing Russet	176	95	22.9
Red Norland	179	96	20.7
Red Pontiac	198	96	22.2
Redsen	137	89	20.5
Russet Burbank	160	86	23.1
Russet Norkotah	169	94	22.0
ND551-9	167	91	22.4
ND671-4Russ	141	89	23.1
NDT-9-1068-11R	153	92	23.1
Average	166	92	22.4

**MINOT**

Cultivar or Selection	Yield U.S. No. 1 Cwt/A	% U.S. No. 1	% Total Solids
Kennebec	191	96	22.4
Norchip	232	97	24.4
Norgold Russet	216	94	20.3
NorKing Russet	262	98	22.4
Red Norland	266	95	18.4
Red Pontiac	327	97	19.0
Redsen	175	96	19.9
Russet Norkotah	238	98	21.6
ND651-9	253	95	21.8
ND671-4Russ	234	95	21.4
NDT-9-1068-11R	183	93	21.4
Average	234	96	21.2



North Dakota Table 5. 1987 Chip Tests (Agtron) of Cultivars and Selections Grown at Park River and Grand Forks in 1986.

Cultivar or Selection	0 weeks 38°F		2 weeks 65°F		4 weeks 65°F		Percent yield average 3 tests	
	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River
Kennebec	13	13	30	24	29	44	31.3	31.2
Norchip	12	16	28	26	48	49	33.0	33.3
Norgold Russet	17	8	16	20	27	29	32.5	31.9
NorKing Russet	13	13	22	26	32	30	32.1	31.4
Super Norgold Russet	9	11	16	19	23	27	31.4	33.0
Russet Burbank	12	14	23	25	29	38	34.3	33.8
TND22-2	19	16	22	26	46	47	34.6	33.6
ND398-1	17	14	50	46	53	58	35.9	33.4
ND534-4Russ	12	14	22	20	29	33	32.8	32.5
ND651-9	20	19	34	41	45	57	32.5	32.9
ND671-4Russ	14	16	22	24	29	34	32.0	30.7
ND860-2	29	26	52	45	57	49	33.8	32.6
ND1113-10Russ	14	10	22	29	30	38	33.0	32.0
ND1215-1	13	20	25	33	38	49	33.0	33.2
ND1215-16	18	16	35	24	35	37	34.1	31.7
ND1859-3	11	15	23	21	35	33	32.3	32.1
Average	15.2	14.4	26.4	28.1	36.6	40.8	33.0	32.4

North Dakota Table 6. Average Scores for French Fry and Flake Tests<sup>1/</sup>.

Cultivar or Selection	French Fries					Flakes				
	Color	Texture	Flavor	Score	Ranking	Color	Texture	Flavor	Score	Ranking
Kennebec	7.4	7.2	7.1	7.2	6					
Norchip	8.3	7.0	6.3	7.2	8	7.2	6.8	6.9	7.0	1
Russet Norkotah	5.9	6.8	6.5	6.4	16					
NorKing Russet	6.6	6.6	6.3	6.5	14					
Viking	5.2	5.6	5.8	5.5	22					
Russet Burbank	6.4	6.9	6.3	6.5	13	7.5	6.4	6.1	6.7	4
Russet Burbank ref.*	7.5	7.0	7.6	7.4	4					
Shepody	5.6	6.4	6.0	6.0	19					
TND22-2	8.5	7.5	5.7	7.2	7	7.7	6.4	6.3	6.8	2
ND398-1	8.1	7.8	6.4	7.4	2	7.4	6.1	6.4	6.6	5
ND651-9	8.5	6.3	6.5	7.1	9					
ND860-2	8.0	8.2	5.9	7.4	3	5.5	6.1	6.7	6.1	6
ND1113-10	6.8	6.7	6.8	6.8	11					
ND1215-1	7.0	6.3	6.8	6.7	12	6.7	6.9	6.5	6.7	3
ND1378-4	7.0	7.4	7.4	7.3	5					
ND1520-3	5.2	5.5	5.5	5.4	24					
ND1538-1	5.2	5.5	5.7	5.5	23					
ND1719-5	6.3	5.6	5.7	5.9	21					
ND1850-5	5.7	6.8	6.3	6.3	17					
ND1859-3	6.3	6.1	5.4	5.9	20	4.1	6.6	4.7	5.1	7
ND2031-8	8.2	7.5	7.1	7.6	1					
ND2019-1	6.7	7.4	6.4	6.8	10					
ND2051-1	5.8	6.7	6.9	6.5	15					
ND2141-4	4.1	4.7	5.0	4.6	25					
ND2208-7	6.2	5.7	6.3	6.1	18					

\*Commercial package

Rating Guide

7-9 — Good  
 5-6 — Fair, but acceptable  
 1-4 — Poor, not acceptable

<sup>1/</sup> All french fries and flakes were tested three times, except Russet Burbank and Russet Burbank reference which were tested 13 times

North Dakota Table 7. 1987 Cooking Tests of Cultivars and Selections Grown at Grand Forks and Park River,  
North Dakota - 1986<sup>1/</sup>

Cultivar or Selection	Boiling									
	Slough- ing <sup>2/</sup>	Mealiness <sup>3/</sup>	Color		After Cooking <sup>4/</sup>	5/ Cooking	Flavor <sup>6/</sup>	Color		Flavor
			After Cooking	4 Hours				Mealiness	Baking Color	
ND1871-3R	8.5	5.1	8.1		8.0		7.2	5.8	9.8	6.6
ND1562-4R	8.2	5.5	7.3		8.0		6.4	5.1	8.5	6.3
ND651-9	5.0	6.9	9.6		7.0		6.8	6.8	10.0	7.2
Norchip	8.0	8.0	8.0		7.0		7.5	6.5	10.0	7.5
ND671-4Russ	5.2	8.4	7.6		6.0		7.9	8.7	8.3	8.1
ND1892-2R	6.5	6.3	7.6		8.3		6.8	5.4	7.5	6.4
Red Norland	9.0	6.0	8.0		8.0		7.0	4.5	9.0	7.0
ND1215-16	8.8	6.9	8.2		7.0		7.5	6.8	7.8	7.5
ND1215-1	7.2	7.8	7.4		8.0		7.3	7.8	8.0	7.6
TND22-2	3.5	9.7	7.0		10.0		7.7	7.0	8.0	6.5
ND860-2	6.7	7.1	8.4		5.3		6.7	7.5	8.3	7.0
ND19-1068-11R	8.8	5.4	9.0		8.5		7.5	5.6	9.8	6.5
Red Pontiac	10.0	5.0	8.0		9.0		6.7	6.5	8.0	6.0
ND1113-10Russ	8.5	5.7	9.0		10.0		8.0	7.5	10.0	8.5
NorKing Russet	8.0	6.7	7.5		8.0		7.0	6.5	9.0	3.5
Redsen	8.0	4.7	5.0		7.0		6.0	5.5	8.0	7.0
Russet Burbank	7.5	8.7	7.0		9.0		9.0	8.0	8.0	7.0
ND534-4Russ	7.0	8.5	7.0		6.0		8.5	8.0	8.0	7.0
Norgold Russet	8.5	9.3	7.0		9.0		8.3	6.5	9.0	7.5
Kennebec	8.5	7.0	8.5		8.0		7.7	7.0	7.0	8.0
ND1859-3	7.0	8.0	2.0		5.0		7.7	7.4	2.0	7.1
ND791-5R	9.4	4.7	8.5		8.5		6.0	5.0	9.0	6.7
ND1196-2R	8.9	4.9	9.5		9.5		7.2	4.7	9.3	6.9
ND398-1	4.0	9.3	6.5		7.0		8.0	7.0	7.0	6.0
Super Norgold Russet	8.0	7.3	10.0		8.0		8.3	7.0	9.0	7.5

1/ Average of two locations (Grand Forks and Park River)

2/ Severe Sloughing - 1; No Sloughing - 10

3/ Not Mealy - 1; Very Dry and Mealy - 10

4/ Dark - 1; Very White - 10

5/ Dark - 1; Very White - 10

6/ Poor Flavor - 1; Excellent Flavor - 10

THE OHIO STATE UNIVERSITY, OHIO AGRICULTURAL RESEARCH AND  
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### Introduction

Eight cultivars were planted in each of five farms. These farms were selected in order to give different soil and climate conditions. The cultivars were selected either because they looked promising in previous over-the-state trials or looked promising in the observation trials on two cooperating farms or were selected from the cultivar plots at the Ohio Agricultural Research and Development Center (OARDC), Wooster. The Katahdin and Norchip cultivars were included as standard varieties.

In addition, the main cultivars were planted at the Campbell Institute for Research and Technology (Napoleon, Ohio), the Muck Crops Branch (Willard, Ohio) and the OARDC. The data from these locations will be included in this report.

### Farm Locations

The five farms referred to in the introduction are as follows:

- Farm 1 (M) - Michael Farms, Urbana, Ohio, Champaign County -- main plots plus russet plots.
- Farm 2 (TH) - Thompson Farms, Hanoverton, Ohio, Columbiana County -- main plots plus observation plots.
- Farm 3 (Mel) - Mellinger Farms (Crystal Springs Farm), Leetonia, Ohio, Columbiana County -- main plots plus observation plots.
- Farm 4 (L) - Logan Farms, Mt. Gilead, Ohio, Morrow County -- main plots plus Monona seed source plots.
- Farm 5 (C) - Chase Farms, Defiance, Ohio, Defiance County -- main plots plus russet plots. Harvest was delayed due to wet weather.

See table 2 for summary of cultural practices followed on these cooperating farms -- planting dates, harvest dates, rainfall and related information.

### Procedures

Eight cultivars were planted in four replicates in most cases on each of the five farms. In addition, 13 additional cultivars were planted for observation in smaller triplicated plots on Farms 2 and 3. Also, ten russet cultivars were likewise planted on Farms 1 and 5, and six different sources of Monona were similarly planted on Farm 4.

Farms 1 and 4 were planted May 1 to 14, but planting at Farm 5 was delayed by rain until June 17. The growers' planters were used by driving very slowly. The potatoes

were harvested with old flat bed diggers, then picked up and weighed. A representative 50 lb sample was then graded with ten tubers cut for internal defects. A sample of each cultivar was then taken to O.S.U. for chip test.

Katahdin and Norchip were used for comparison in the main trials, Superior, Atlantic, and Kennebec in the observation trials and Belrus and Russet Burbank in the Russet trials. During the growing season, stand counts were made and plant disease and stress were recorded as well as maturing season.

#### Weather and Growing Conditions

The winter of 1986-87 was unusually warm and dry. This was followed by a warm and dry spring in 1987, in which a few days were hot. June and July were extremely hot and humid, and July was generally quite dry. Farm 4 lies in an area of Ohio later designated a distress area due to excessive rain and flooding early in the season. It was followed by the July and early August dry period. The rainfall condition at Farm 5 is explained later under the tuber defects. Farm 1 was partially irrigated throughout the season, but was not thoroughly irrigated due to location of the test plots for the July 30 Ohio Potato and Vegetable Field Day.

On Farm 2, LoroX + Dual was applied, but the second and final cultivation was missed due to rains until the plants were too large. As a result, a heavy growth of weeds, mostly ragweed, between the hilled rows apparently absorbed the limited moisture resulting in unusual and extremely low yields of some of the replicates. Most of the replicate samples were discarded as not indicative of the yielding ability of those cultivars. These extremely low yields were in the area where the weed growth was greatest. Also, as explained later under plant stress, heat and air pollution may have caused considerable injury. Farm 3, with the highest yields of the five farms, had adequate rainfall in June (4.3" on July 1 and 2, and 1" on July 29) to offset the dry July and August period.

#### Yields

Gross yields as well as U.S. No. 1 yields are shown in the attached tables for the main trials as well as other data. The percent of U.S. No. 1 tubers and the CWT per acre are shown in the other tables. The yields varied greatly from farm to farm. They averaged lower than in some years.

#### Stands

Stands were good in 1987. Favorable conditions existed, with May and early June being unusually warm and receiving sufficient rainfall. No stand count was made on Farm No. 5 because of very late planting in relation to the other four farms.



The average percentage of a perfect stand on the other four farms for the main trials was 92.5%. With quite similar spring conditions in 1986, the average was 95%, the highest on record. The average for the preceding 11 years was 87%, of which the highest was in 1984 at 91%.

The 1987 average for the observation trials on two farms was 88%, for the Russet trials on Farm 1, 88%, and for the Monona trials on Farm 4, 95%.

Because of the uniformity and excellence of stand, no stand data pertaining to the various entries is being included in this report.

#### Plant Disease, Stress, and Injury

Early blight was severe on Farm 2 on Norchip, Chippewa, Russet Norkotah, ND860-2, and Conestoga in the main trials and in ND1113-10, W848, Sunrise, Yukon Gold, and Norland in the observation trials. It was noted moderate to severe on LA01-38, Katahdin, Atlantic, and NemaRus. It was moderate on Superior and W779. It was only slight on the others, MS700-70, B7592-1, Campbell 14, Kennebec, W855, and Elba.

Severe stress injury occurred on many cultivars on Farm 2 in late July from air pollution and the excessive heat and lack of moisture. Almost none was found on Farm 3, 13 miles away from Farm 2. The difference might be explained by 4.3" of rainfall on Farm 3 on July 1 and 2, and only 2.1" on Farm 2 on the same dates plus weed problems on the latter. Neither farm had any appreciable rainfall for four weeks after July 1-2. Farm 2 lies in a valley, while Farm 3 is on level land. The records were taken on both farms on July 28. It had been excessively hot and humid for the preceeding week. On July 29, Farm 4 showed similar injury, particularly in the replicates on the lower side of a small slope in the plot area.

The injury was severe on Norland, ND860-2, Sunrise, and Conestoga. It was moderate on Yukon Gold, Chippewa, Norchip, Russet Norkotah, and B7592-1. None was seen on Katahdin, Superior, MS700-70, and Elba. All of the other entries showed slight injury. At Farm 4, the most severely injured were replicates of ND860-2, Russet Norkotah, Norchip, and Conestoga, and of course, Norland. The same cultivars showed very slight injury at Farm 3.

#### Tuber Defects

The attached tables briefly list the external defects. Very little scab was found in 1987. The other defects were mostly misshapen, growth cracks, and second growth.

Internal defects were generally minor and much less than in many years, except on Farm 5. Ten tubers from each replicate were cut. Only defects exceeding 5% of all tubers cut of any cultivar were listed herein.

On Farm 1, LA01-38 and Norchip each showed 10% stem end discoloration. On Farm 2, LA01-38 showed 7% stem end discoloration, Atlantic had 13% internal discoloration, and NemaRus and Elba each had 10% of the latter. On Farm 3,



internal discoloration was 10% in Norchip, 30% in Atlantic, and 13% in Elba. Stem end discoloration was found in Katahdin at 12.5% and in Elba at 10%. No defects over 5% were seen on Farm 4.

At Farm 5, an unusual season gave unusual results. As already stated, rains in May delayed planting until June 17. Three inches more rain then fell until the plants would have fully emerged. Then, when moisture was badly needed for plant growth and tuber formation, only 1.4" of rain fell for over four weeks. Beginning August 22, over 4" of rain fell in nine days, with adequate rains through September. This resulted in very late and very rapid growth resulting in every entry except MS700-70 showing some degree of hollow heart (H.H), some of it very severe.

In the main trials, the cultivars showing above 5% H.H. were Russet Norkotah 505, LA01-38 30%, Norchip 10%, and Katahdin 22.5%. All of the russets were over 5% and the percentages are listed below.

A7652-1	77	Belrus	37	A72685-2	17
NemaRus	17	A75188-3	10	AC77513-1	77.5
ND671-4	37	Rus, Burbank	13	ND534-4	20

These with a high percentage might be considered to be very susceptible to hollow heart.

TABLE 1. Soil Analysis, 1987, Statewide Trials  
\*Cooperating Farms

	1 - M	2 - TH	3 - MEL	4 - L	5 - C
pH	5.9	5.6	6.2	5.7	6.2
P (lbs/A)	250+	250+	250+	128	106
K (lbs/A)	619	563	412	315	160
Ca (lbs/A)	2450	1280	3020	2310	2150
Mg (lbs/A)	533	334	157	234	133
C.E.C. MEQ	13	10	11	12	6
Ca % B.S.	48	32	68	48	88
Mg % B.S.	17	14	6	8	9
K % B.S.	6.2	7.1	4.7	3.4	3.3
Mn (lbs/A)	104	88	81	70	44
Zn (lbs/A)	19.9	18.9	16.6	8.6	7.2
B (lbs/A)	.9	1.2	1.6	.6	.8
O.M %	2.5	2.1	2.7	2.6	1.4

- \* 1 - Michael Farms, Urbana
- 2 - Thompson Farms, Hanoverton
- 3 - Mellinger Farms, Leetonia
- 4 - Logan Farms, Mt. Gilead
- 5 - Chase Farms, Defiance

Soil analyses made by REAL Laboratory, Ohio Agricultural Research and Development Center, Wooster, Ohio.

TABLE 2. Total Yield, Marketable Yield, and Percent U.S. No. 1 for Main Trial Cultivars; Statewide Trials, 1987.

	Farm 1 (H)			Farm 2 (TH)			Farm 3 (Hel)			Farm 4 (L)			Farm 5 (C)			Total (Farms 1-5)		
	Total U.S.	U.S.		Total U.S.	U.S.		Total U.S.	U.S.		Total U.S.	U.S.		Total U.S.	U.S.		Total U.S.	U.S.	
	Yield No.1	Mo.1	%	Yield No.1	Mo.1	%	Yield No.1	Mo.1	%	Yield No.1	Mo.1	%	Yield No.1	Mo.1	%	Yield No.1	Mo.1	%
	cwt/A	cwt/A	%	cwt/A	cwt/A	%	cwt/A	cwt/A	%	cwt/A	cwt/A	%	cwt/A	cwt/A	%	cwt/A	cwt/A	%
Chippewa	265	228	87	161	147	91	463	417	90	352	309	88	403	344	85	329	289	88
Conestoga	233	208	89	164	132	80	371	336	91	-	-	-	-	-	-	256	225	88
Katahdin	234 <sup>1</sup>	204	87	118	105	89	455	413	91	350	320	91	378	339	90	307	276	90
LA01-38	360	343	95	149	132	89	477	435	91	423	409	97	391	331	85	360	330	92
HS 700-70	159 <sup>1</sup>	148	93	216	189	88	455	422	93	394	371	94	337	274	81	313	281	90
Worship	248	198	80	177	141	80	484	399	82	342	266	78	418	180	43	334	236	71
NU860-2	262	227	87	145	126	87	401	361	90	265	240	91	290	251	87	273	241	88
Russet Norkotah	341	289	85	159	132	83	446	390	87	298	264	89	381	284	75	325	272	84
Mean	249	231	93	161	138	86	444	397	89	347	311	90	371	289	78	314	273	87

<sup>1</sup> Some replicates damaged by irrigation wheel.

TABLE 3. Summary of the Main Trials - Average of five farms by entry, 1987

Entry	Total Yields cwt/A	Percent		U.S. No.1 Yields cwt/A	U.S. No.1 Major Defects	
		B's	Culls		External Average %	Culls
LA01-38	360	2.7	6.5	90.8	330	
Chippewa	329	4.1	7.9	87.9	298	7.8 Sh. 2nd.
MS700-70	313	3.6	7.6	88.8	281	6.2 Sh. 2nd. Cr.
Katahdin	307	3.8	6.7	89.6	276	6.2 Sh. 2nd.
Average	314	5.0	9.2	85.9	273	
Russet Norkotah	325	6.3	10.4	83.4	272	10.4 Sh. 2nd.
ND860-2	273	8.4	3.7	88.0	241	
Norchip	329	7.0	20.3	72.7	236	20.3 Sh. 2nd. Cr.
Conestoga	256	4.3	9.4	85.8	225	6.7 Sh. Cr.

Sh - shape; EB - early blight; Int. Dis. - internal discoloration;  
2nd - second growth; Cr - growth cracks

TABLE 4. Average Yields and Grades of Observation Trials. Cultivars, by farm and average, of U.S. No. 1 tubers. 1987. (Percent U.S. No. 1 and cwt/A)

Farm No. 2 - TH			Farm No. 3 - MEL			Average		
Entry	%	cwt	Entry	%	cwt	Entry	%	cwt
Atlantic	87	169	Kennebec	75	430	Kennebec	78	282.5
NemaRus	83	154	Elba	89	407	Atlantic	88	280
Campbell 14	95	143	W855	83	399	Elba	87	270.5
Kennebec	81	135	Atlantic	89	391	W855	91	267
W855	90	135	Sunrise	91	390	Campbell	91	257.5
Elba	86	134	B7592-1	90	390	W848	83	251
Yukon Gold	95	128	W848	83	380	Sunrise	89	248
W848	81	122	Superior	92	375	B7592-1	79	246.5
B7592-1	72	121	Campbell 14	92	372	Superior	89	243
Superior	87	111	Yukon Gold	87	363	NemaRus	85	228.5
Sunrise	88	106	W779	74	311	Yukon Gold	91	220
W779	67	82	NemaRus	87	303	W779	70	196.5
Average	84	128	Average	87	372	Average	85	250

V. Early- Sunrise. Early- Yukon Gold. Med. Early- ND1113-10.  
Midseason- NemaRus, W779, Atlantic, W848, Kennebec, B7592-1, Superior.  
Late- Campbell 14, W855. Very Late- Elba.

TABLE 5. Average Yield and Grades of Russet Trials. Cultivars, by farm and average of U.S. No. 1 tubers, 1987. (percent U.S. No. 1 and cwt/A)

Farm No. 1 - M			Farm No. 5 - C			Average		
Entry	%	cwt	Entry	%	cwt	Entry	%	cwt
NemaRus	85	217	(1)ND534-4	87	362	ND671-4	82	268
ND671-4	80	205	A75188-3	90	340	ND534-4	74	263
(1)ND534-4	62	165	ND67104	84	331	NemaRus	84	243
Belrus	60	119	A72685-2	85	305	A72685-2	79	207
A72685-2	72	109	AC7652-1	80	298	A75188-3	80	195
AC77652-1	70	85	NemaRus	82	268	AC7652-1	75	192
AC77513-1	70	64	AC77513-1	71	268	AC77513-1	71	166
A75188-3	70	50	Belrus	64	191	Belrus	62	155
Rus Burbank	23	44	Rus Burbank	48	173	Rus Burbank	36	109
Average	66	118	Average	77	282	Average	71	200
W752	90	313						
Norland	86	272						
Norland	82	236						
Average-12	71	157						
Av. omitting								
Rus Burbank		167						

(1) Russet Norkotah

Some Known Characteristics

ND534-4	(see Main Trials)
NemaRus	For table use. H.H. problem.
Belrus	Low yields, V. Susc. to EB, etc.
A72685-2	For table use. Long, good yields.
Burbank	High Sp. Gr. Not adapted to Ohio.

TABLE 6. Source of Seed Trials - Monona - 1987. Total weight, average percent U.S. No. 1 and cwt/A.

STATE	TOTAL	% U.S. No. 1	CWT/A
Maine	124.5	89.5	343
New York (Mehl.)	109.3	92.3	311
	109.2	90.2	296
Nebraska	94.3	90.1	261
New York (Kent)	102.5	88.8	261
Wisconsin	84.3	88.3	231
Average	103.2	88.8	284

POTATO VARIETY TRIAL 1987

MUCK CROPS BRANCH  
O.A.R.D.C. - O.S.U.

Variety	Marketable cwt/A	Large Tubers cwt/A	Culls cwt/A	Ct/8 lbs	Specific Gravity
Donna	249	27	85	18	1.063
Norchip	223	32	34	27	1.069
Red Norland	206	38	39	26	1.060
Atlantic	205	28	6	25	1.078
NY 81	191	27	17	19	1.065
Conestoga	186	43	23	31	1.065
8N 9803-1	185	40	21	27	1.075
MS 700-83	183	31	2	26	1.068
ND 860-2	183	32	20	30	1.066
Monona	181	17	53	22	1.060
NY 79	173	34	13	32	1.062
Chippewa	165	19	32		
NY 76	164	42	20	35	1.060
W848	163	17	24	17	1.062
Katahdin	148	20	24	21	1.060
MS 700-70	139	27	16	29	1.068
ND 1113-10	130	37	40	24	1.060
ND 671-4 Russ	120	34	22	21	1.065
AF 235-1	112	20	14	19	1.068
Russet Burbank	108	40	49	31	1.062
LA 01-38	102	20	11	20	<1.060
Russet Norkotah	94	26	24	18	<1.060
NemaRus	92	17	10	25	1.063
A 72685-2	58	18	11	36	1.060

Seeded: May 28, 1987

Harvested: September 9, 1987

Plot size: 2 row, 32" apart, 20' long

3 replications/variety

OBSERVATION POTATO VARIETY TRIAL RESULTS  
CAMPBELL INST. OF RESEARCH AND TECHNOLOGY  
NAPOLEON, OH 1987

Variety	Yield cwt		Percent by Weight			Percent Internal Browning
	Total	Usable	<1 7/8"	>1 7/8"	Rot	
Atlantic	371	347	5.6	93.4	1.0	10
NY 81	306	266	12.1	86.9	1.0	10
MS 716-15	305	271	10.9	88.9	0.3	0
Denali	296	138	16.9	80.5	2.6	40
MN 12567	293	231	21.0	79.0	0	60
MS 702-80	277	261	4.7	94.4	0.8	20
WIS 779	275	239	12.0	86.9	1.1	50
ND 651-9	268	240	9.5	89.4	1.1	0
W 752	268	222	16.4	83.0	0.6	0
NDT 9-1068-11R-5	264	235	9.9	88.9	1.2	20
NY 79	251	221	7.7	88.3	4.0	10
F 70021	250	228	6.2	91.1	2.8	0
Sunrise	245	207	15.4	84.6	0	20
NY 76	241	175	27.4	72.6	9	10
Norgold (Super)	225	157	29.4	69.6	1.0	30
A219.70-3	219	188	13.7	85.6	0.7	10
WIS 879	214	158	13.3	73.7	13.0	60
NY 71	195	150	19.0	77.1	4.0	0
MN 12331	181	108	40.4	59.6	0	0
AF 236-1	175	135	22.0	77.1	0.9	50
WIS 848	174	139	19.9	80.1	0	10
Kennebec	168	128	22.8	75.8	1.4	60
Superior	165	148	9.8	89.7	0.5	0
WISC 80-26.86	145	68	52.9	47.1	0	30
NY 78	144	89	36.9	62.0	1.1	20
WIS 921	139	81	39.2	58.0	2.8	10
NEA 71.72-1	119	92	21.9	76.8	1.3	50
BN 9803-1	116	62	29.8	53.6	16.6	60
ND 671-4	84	52	34.9	62.4	2.8	10
MN 12945	46	21	55.0	45.0	0	10

Planted: May 22, 1987  
Harvested: September 8, 1987  
Plot size: single row, 34" x 20'  
No replications



REPLICATED POTATO VARIETY RESULTS  
 CAMPBELL INST. OF RESEARCH AND TECHNOLOGY  
 NAPOLEON, OH 1987

Variety	Yield cwt		Percent by Weight		Rot	Percent Internal Browning
	Total	Usable	<1 7/8"	>1 7/8"		
Conestoga	275	253	8.6	91.4	0.1	8
LA01-38	264	232	12.3	87.6	0.1	18
MS 700-83	262	227	9.8	86.1	4.1	10
Norchip	262	218	17.4	82.4	0.2	8
ND 860-2	257	224	13.1	86.7	0.2	8
Chippewa	239	204	14.3	85.3	0.4	52
WIS 832	227	196	10.4	87.0	2.6	8
MS 700-70	195	166	14.9	84.9	0.2	2
Monona	189	162	13.9	85.2	0.9	52
Russet Norkotah						
ND534-4	169	112	33.2	65.9	0.9	25
Katahdin	166	134	18.3	80.1	1.5	45
NemaRus	69	18	76.5	22.3	1.3	12
Waller LSD 0.05	51	49	7.8	8.5	3.3	22
C.V.	17.7	20.3	29.9	8.3	166.9	75.3
Mean	215	179	20.2	1.0	2.1	

Planted: May 22, 1987  
 Harvested: September 8, 1987  
 Plot size: single row, 34" x 20'  
 4 replications

CHIP TRIALS TABLE 1. Yield, Marketable Yield, Percentage of Yield by Grade Distribution and Specific Gravity for Cultivars Grown at Wooster, Ohio - 1987.

Cultivar	Total Yield cwt/A	U.S. No. 1 cwt/A	U.S. No. 1 %	B size %	Culls %	Specific Gravity
Atlantic	261	191	73	7	20	1.095
MS 700-70	231	150	65	13	22	1.084
MS 702-80	237	161	68	11	21	1.086
MS 700-83	332	236	71	14	15	1.084
Denali	279	193	69	14	17	1.092
Monona	202	119	59	17	24	1.072
BN 9803-1	272	174	64	15	21	1.081
W779	276	193	70	10	20	1.085
W848	308	228	74	9	17	1.082
LA01-38	283	226	80	10	10	1.080
Norchip	309	204	66	13	21	1.078
ND860-2	244	159	65	14	21	1.087
W832	273	199	73	9	18	1.087
NY 81	274	186	68	13	19	1.090
W879	192	-	-	-	-	1.088
Chippewa	354	241	68	8	24	1.068

CHIP TRIALS TABLE 2. Tuber Data and Internal Disorder Ratings for Cultivars Grown at Wooster, Ohio - 1987.

	Tuber Data <sup>z</sup>					Internal Disorders <sup>y</sup>			
	Tuber Color	Skin Text.	Tuber Shape	Eye Depth	Overall Appear.	Hollow Heart	Internal Necrosis	Stem End Discolor	Vasc. Discolor
Atlantic	5	5	3	5	6	0	4	3	0
MS 700-70	-	-	-	-	-	1	2	0	0
MS 702-80	7	6	2	4	5	0	0	0	0
MS 700-83	6	6	3	6	7	0	1	0	0
Denali	6	6	5	4	3	1	2	2	0
Monona	7	7	3	4	4	0	0	0	0
BN 9803-1	6	7	3	7	7	0	1	0	1
W779	4	3	5	5	5	0	0	0	0
W848	7	6	6	7	5	0	0	2	0
LA01-38	7	6	3	6	6	0	0	0	0
Norchip	7	7	5	6	4	0	0	0	0
ND860-2	7	7	2	5	8	0	0	0	0
W832	7	6	4	6	6	0	0	0	0
NY 81	7	6	3	5	5	1	0	0	0
W879	7	6	3	5	2	0	0	0	0
Chippewa	7	7	3	4	3	0	0	0	0

<sup>z</sup> Tuber Data Rating System

Tuber Color

- |           |               |          |
|-----------|---------------|----------|
| 1. Purple | 4. Dark brown | 7. Buff  |
| 2. Red    | 5. Brown      | 8. White |
| 3. Pink   | 6. Tan        | 9. Cream |

Skin Texture

- |                 |                 |                |
|-----------------|-----------------|----------------|
| 1. Part. russet | 4. Light russet | 7. Mod. smooth |
| 2. Heavy russet | 5. Netted       | 8. Smooth      |
| 3. Mod. russet  | 6. Slight net.  | 9. Very smooth |

Tuber Shape

- |                 |                 |                |
|-----------------|-----------------|----------------|
| 1. Round        | 4. Mostly obl.  | 7. Mostly long |
| 2. Mostly round | 5. Oblong       | 8. Long        |
| 3. Rd. to obl.  | 6. Obl. to long | 9. Cylindrical |

Eye Depth

- |       |                 |       |
|-------|-----------------|-------|
| 1. VD | 4. --           | 7. S  |
| 2. -- | 5. Intermediate | 8. -- |
| 3. D  | 6. --           | 9. VS |

Appearance

- |              |         |              |
|--------------|---------|--------------|
| 1. Very poor | 4. --   | 7. Good      |
| 2. --        | 5. Fair | 8. --        |
| 3. Poor      | 6. --   | 9. Excellent |

<sup>y</sup> Hollow Heart, internal necrosis ratings and discoloration ratings indicate the number of affected tubers found per 30 large tubers sampled.

CHIP TRIALS TABLE 3. Percentage Plant Stand, Vines Dead 112 DAP, and Blister; Chip Color, Agtron (E5F-90), and External Tuber Defects Ratings for Cultivars Grown at Wooster, Ohio - 1987.

	Plant Stand %	% Vines Dead 112 DAP	External Tuber Defects				% Blister	Chip Color	Agtron E5F-90
			Growth Cracks	Second Growth	Sun Green	Total			
Atlantic	91	82	0.0	0.0	8.0	8.0	60 <sup>z</sup>	1 <sup>y</sup>	59.3
MS 700-70	91	65	0.0	5.0	2.7	7.7	40	1	56.0
MS 702-80	97	97	0.0	1.3	0.0	1.3	0	1	61.0
MS 700-83	71	93	8.0	0.0	2.7	10.7	10	1	63.0
Denali	80	73	4.0	4.0	5.0	13.0	20	1	59.0
Monona	79	88	6.7	0.0	1.3	8.0	40	1	61.0
BN 9803-1	98	99	0.0	0.0	12.0	12.0	0	1	57.0
W779	87	83	2.7	6.7	0.0	9.4	10	1.5	55.9
W848	94	73	0.0	0.0	2.7	2.7	30	1.5	64.0
LA01-38	91	78	0.0	0.0	0.0	0.0	20	1.5	55.0
Norchip	96	85	4.0	4.0	18.7	26.7	30	1	52.0
ND860-2	83	97	0.0	0.0	6.7	6.7	20	1	59.2
W832	97	92	1.3	0.0	14.7	16.0	0	1.5	57.0
NY 81	70	72	0.0	0.0	4.0	4.0	0	1.5	57.6
W879	84	75	0.0	0.0	1.3	1.3	60	1	64.4
Chippewa	88	83	0.0	2.7	21.3	24.0	20	1	61.0

<sup>z</sup> Percentage of chips which develop blisters greater than 20 mm in diameter during the frying process.

<sup>y</sup> PC/SFA designation

OBSERVATION TRIALS TABLE 1. Yield, Marketable Yield, Percent of Yield by Grade Distribution and Specific Gravity for Cultivars Grown at Wooster, Ohio 1987.

Cultivar	Total Yield cwt/A	U.S. No.1 cwt/A	Percent U.S. No.1	B Size %	Culls %	Specific Gravity
WNC 672-2	257	-	-	-	-	1.065
Campbell 14	290	220	76	9	15	1.081
MS 702-91	230	-	-	-	-	1.060
MN 10874	249	-	-	-	-	1.064
WIS 80-26.86	133	-	-	-	-	1.081
WIS 81-38.26	198	-	-	-	-	1.082
WIS 1005	305	198	65	15	20	1.065
WIS 979	269	-	-	-	-	1.073
ND 1113-10 Rus	303	-	-	-	-	1.085
ND 1215-1	295	204	69	10	21	1.072
NDT 9-1068-11R	213	-	-	-	-	1.067
NY 71	228	-	-	-	-	1.074
WIS 855	264	214	81	10	9	1.082
WIS 971	278	-	-	-	-	1.065
D 191-2	247	192	78	10	12	1.070
D 195-11	109	-	-	-	-	1.075
NY 78	139	-	-	-	-	1.071
AF 465-2	213	-	-	-	-	1.074
CF 7523-1	407	265	65	10	25	1.079
AF 522-5	232	-	-	-	-	1.078
AF 7411-2	232	-	-	-	-	1.068
CS 7635-4	288	191	67	7	26	1.078
F 72090	327	-	-	-	-	1.078
AC 80545-1	257	-	-	-	-	1.071
BC 0038-1	165	-	-	-	-	1.068
AC 77101-1	211	-	-	-	-	1.060
AC 77226-13	131	-	-	-	-	1.073
AC 77226-10	118	-	-	-	-	1.077
CD 8011-5	213	-	-	-	-	1.076
Chippewa	303	230	76	8	16	1.065
A 75188-3	267	-	-	-	-	1.064
A 76147-2	208	-	-	-	-	1.066
NY 72	344	-	-	-	-	1.068
Kennebec	318	230	72	10	18	1.074

OBSERVATION TRIALS TABLE 2. Tuber Data and Internal Disorder Ratings for Cultivars  
Grown at Wooster, Ohio - 1987

	Tuber Data <sup>z</sup>					Internal Disorders <sup>y</sup>			
	Tuber Color	Skin Text.	Tuber Shape	Eye Depth	Overall Appear.	Hollow Heart	Internal Necrosis	Stem End Discolor	Vasc. Discolor
WNC 672-2	4	5	2	6	6	1	5	0	0
Campbell 14	6	7	3	6	6	0	0	0	0
MS 702-91	7	5	3	6	7	0	4	1	0
MN 10874	5	4	6	7	5	0	0	0	0
WIS 80-26.86	7	5	6	7	2	0	0	0	0
WIS 81-38.26	5	3	5	6	5	0	0	0	0
WIS 1005	5	4	8	6	5	0	0	0	0
WIS 979	7	6	4	5	6	0	0	0	0
ND 1113-10 Rus	5	3	6	5	7	0	0	0	0
ND 1215-1	7	5	3	6	5	0	3	0	0
NDT 9-1068-11R	2	6	5	5	3	1	0	0	0
NY 71	6	5	3	6	6	0	0	0	0
WIS 855	7	4	2	4	5	0	0	2	0
WIS 971	6	5	4	5	6	0	0	1	0
D 191-2	2	6	2	6	7	0	0	0	0
D 195-11	6	7	2	5	2	0	0	0	0
NY 78	6	6	3	5	5	0	0	0	0
AF 465-2	4	5	3	5	3	0	0	0	0
CF 7523-1	7	6	4	3	3	0	0	0	0
AF 522-5	4	2	6	6	4	0	0	0	0
AF 7411-2	5	2	7	5	2	0	0	0	0
CS 7635-4	7	6	3	4	3	0	0	0	0
F 72090	6	7	2	5	5	0	0	0	0
AC 80545-1	5	5	5	5	2	0	0	0	0
BC 0038-1	7	7	5	5	6	0	0	0	0
AC 77101-1	5	4	4	5	6	0	0	0	0
AC 77226-13	5	3	5	7	5	0	0	0	0
AC 77226-10	-	-	-	-	-	0	0	0	0
CD 8011-5	5	3	4	5	5	0	0	0	0
Chippewa	8	7	3	4	3	0	0	0	0
A 75188-3	6	6	3	5	2	0	0	0	0
A 76147-2	4	2	7	5	2	0	0	0	0
NY 72	6	4	3	4	3	0	0	0	0
Kennebec	7	7	5	5	4	0	0	0	0

<sup>z</sup> Tuber Data Rating System

Tuber Color - 1-Purple 2-Red 3-Pink 4-Dark brown 5-Brown 6-Tan 7-Beff 8-White 9-Cream

Skin Texture - 1-Part. russet 2-Heavy russet 3-Mod. russet 4-Light russet 5-Netted  
6-Slight net. 7-Mod. smooth 8-Smooth 9-Very smooth

Tuber Shape - 1-Round 2-Mostly round 3-Rd. to obl. 4-Mostly obl. 5-Oblong  
6-Obl. to long 7-Mostly long 8-Long 9-Cylindrical

Eye Depth - 1- VD 2--- 3-D 4--- 5-Intermediate 6--- 7-S 8--- 9-VS

Appearance - 1-Very poor 2--- 3-Poor 4--- 5-Fair 6--- 7-Good 8--- 9. Excellent

<sup>y</sup> Hollow Heart, internal necrosis ratings and discoloration ratings indicate the number of affected tubers found per 30 large tubers sampled.

OBSERVATION TRIALS TABLE 3. External Defects and Chipping Characteristics for Cultivars Grown at Wooster, Ohio - 1987.

	Plant Stand %	% Vines Dead 112 DAP	External Tuber Defects %				% Blister	Chip Color	Agtron E5F-90
			Growth Cracks	Second Growth	Sun Green	Total			
WNC 672-2	87	50	0	12	0	12	0	1	58.0
Campbell 14	93	65	4	0	8	12	0	1	57.0
MS 702-91	83	97	0	0	8	8	10	1	59.0
MN 10874	100	65	0	0	4	4	20	3	47.3
WIS 80-26.86	97	20	20	28	0	48	0	1	58.0
WIS 81-38.26	97	60	12	12	12	36	30	1	60.5
WIS 1005	97	45	0	4	16	20	70	1	61.1
WIS 979	90	85	0	8	12	20	20	1	62.7
ND 1113-10 Rus	83	97	0	4	0	4	-	-	-
ND 1215-1	87	50	4	12	8	24	50	3	52.7
NDT 9-1068-11R	47	75	0	0	4	4	40	2	61.3
NY 71	97	80	8	0	4	12	30	2	60.8
WIS 855	87	65	0	0	4	4	30	2	61.7
WIS 971	93	80	0	0	0	0	10	2	57.7
D 191-2	97	80	0	0	0	0	50	2	60.0
D 195-11	63	85	25	0	16	41	10	2	59.4
NY 78	80	70	0	0	8	8	20	2	56.3
AF 465-2	80	85	16	8	12	36	40	1	65.0
CF 7523-1	90	70	8	0	12	20	30	2	60.2
AF 522-5	83	100	16	8	4	28	0	3	44.6
AF 7411-2	80	60	12	8	0	20	40	1	65.2
CS 7635-4	93	60	4	4	12	20	20	2	57.3
F 72090	77	100	0	0	8	8	-	-	-
AC 80545-1	87	30	0	16	20	36	0	2	46.0
BC 0038-1	97	100	0	0	12	12	0	1	62.0
AC 77101-1	73	80	8	16	0	24	20	2	49.4
AC 77226-13	53	60	7	0	0	7	0	1	55.0
AC 77226-10	63	70	-	-	-	-	0	1	57.5
CO 8011-5	83	85	24	16	4	44	-	-	-
Chippewa	93	75	16	0	12	28	10	3	45.0
A 75188-3	-	-	8	16	12	36	0	1	56.0
A 76147-2	-	-	0	52	12	64	30	2	44.0
NY 72	-	-	0	8	12	20	0	1	60.0
Kennebec	88	40	0	28	12	40	20	2	59.3



## Texas

J. Creighton Miller, Jr. and Douglas G. Smallwood

### Variety Development and Testing

Seedling Program. Approximately 38,000 first-year seedlings, representing 305 families were grown for selection near Springlake in 1987, and 388 original selections were made from this material. The 1987 first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1985-86. The remainder were obtained from Joe Pavcek in Idaho (12,640), Bob Johansen in North Dakota (10,189) and Dave Holm in Colorado (1,396). The Texas program also supplied the North Dakota, Idaho, and Colorado programs with second, third, and fourth sized seedling tubers for selection.

Adaptation Trials. The 1987 season was marked by seasonal temperatures and minimal rainfall. However, a rapid moving cold front in late March brought record low temperatures of 11 and 14 degrees for two consecutive days. Although this occurred only two days after the Springlake trial was planted, there appeared to be no significant damage. The trials at Springlake were far superior to those at Olton, while vine growth was exceptionally good at both locations. The variety and advanced selection trials at Springlake were planted on March 27 and harvested on August 18. In general, yields were very good. The outstanding russet entries based on total yield and general rating were A 74212-1, Lemhi, Russet Nugget, AC 77101-1 and Norgold "M" (Table 1). Russet Norkotah produced tubers of very uniform shape and size; however, total yield was lower than most of the previously mentioned entries. This variety has been a consistent performer for several years, but additional information is needed regarding cultural practices specific to Texas. The newly released variety Russet Nugget continues to perform quite well. It is very late maturing and has the potential to produce high yields if allowed to grow to maturity. The outstanding white entry (Table 3) was A 7914-3. This selection produces a very vigorous vine which will stay green late in the season. It produces a larger proportion of tubers in the 4-10 ounce range than any of the other entries; however, the specific gravity is quite low. Other white entries deserving mention include: Mn 12567, AC 80545-1 and LA 0138. The outstanding red entry, based on total yield and general rating, was Red LaSoda produced from North Dakota seed. The selection NDTX 9-1068-11 R performed quite well again this year. There was no difference in the performance of Sangre and the Sangre line selections (strains), Sangre #10 and Sangre #14; however, the performance of Sangre #11 was poor. A number of Norgold Russet strains, as well as Norgold Russet were tested at Springlake (Table 3). The outstanding entries based on total yield and general rating were: Norgold "M", Norgold #11, Norgold #19 and Norgold #35.

Norgold #40 produced high yield, but tubers were very rough. In general, the strains continue to outperform regular Norgold Russet.

The strip trial at Olton (Table 4) consisted of 13 of the most promising varieties or advanced selections for which sufficient seed were available for strip planting of 300 foot rows. Strip trials more closely approximate grower conditions and represent a more advanced phase of testing than the normal replicated variety trials. In late August, four randomly selected plots were harvested for each entry. Vines of three entries, Russet Nugget, Denali #19 and A 74212-1, were still green at harvest. The outstanding entry based on total yield was A 74212-1. This selection has performed quite well for a number of years; however, it is a light russet and tubers tend to be rough. The outstanding red entries in this trial were Red La Soda, Sangre and NDTX 9-1068-11 R. Although not as high in total yield, NDTX 9-1068-11 R produced a higher percentage of marketable tubers by weight than did either Red LaSoda or Sangre. Both Sangre and NDTX 9-1068-11 R retained a darker red color than Red LaSoda. Other russet entries which performed quite well were Norgold #40, Russet Nugget and Norgold "M". Norgold #40 produced more tubers in the 4-10 ounce range; however, they were very rough. The entries Russet Norkotah and HiLite did not live up to expectations. The performance of the white entries, New Superior and Denali #19 was also disappointing.

Summarizing results of all trials at both Springlake and Olton, the most promising entries were NDTX 9-1068-11 R, Russet Nugget, A 74212-1 and A 7914-3. The selection A 74212-1 is from the Idaho program and has shown promise for release in the western states. In Texas, it produces high yields; however, its tubers tend to be rough with a very light netting. Selection A 7914-3 produces a very vigorous vine with exceptional yields; however, the specific gravity is somewhat low. The selection NDTX 9-1068-11 R continues to show promise and release as new variety is anticipated. Norgold "M" continues to be the most consistent performer of the Norgold Russet strains and is still the standard russet variety for the industry.

Texas Table 1. Total yield, percent by weight over 4 ounces, average tuber weight of 10 ounces plus grade, average weight per tuber in ounces, specific gravity, tuber type, skin type and general rating of 24 Russet potato varieties or selections grown at Springlake, Texas - 1987.

Variety or Selection	Total Yield CWT/A.	%	Average		Specific Tuber Gravity Type	Skin Type	General Rating 1/
			By Wt. over 4 oz.	Tuber Wt. of 10 Oz. + Grade			
AC 77513-1	389.1	75.3	9.6	5.7	1.062 Long	Russet	2.7
A 74212-1	378.1	72.1	12.3	5.7	1.070 Long	Russet	3.7
Lemhi	365.6	69.5	9.6	5.4	1.063 Long	Russet	3.0
Russet Nugget	364.5	51.5	11.3	4.8	1.070 Long	Russet	3.7
AC 77101-1	349.6	58.2	10.8	5.5	1.062 Oblong	Russet	3.7
Norgold Russet	349.4	51.4	9.9	4.3	1.059 Oblong	Russet	2.7
TX 9-655-20 Ru	334.5	59.9	10.7	5.2	1.063 Oblong	Russet	2.3
Norgold "M"	323.8	72.4	11.3	5.4	1.062 Oblong	Russet	3.7
NDTX 9-1069-4 Ru	321.5	65.5	11.5	5.8	1.060 Oblong	Russet	3.0
Russet Norkotah	303.8	71.8	13.2	6.2	1.057 Long	Russet	4.0
AC 77266-10	301.7	72.1	11.6	5.4	1.060 Oblong	Russet	3.0
TX 9-652-10 Ru	298.5	72.4	10.8	5.0	1.062 Oblong	Russet	3.0
CO 8011-5	284.0	75.4	10.9	6.2	1.057 Oblong	Russet	3.0
MN 10874	278.2	75.6	11.2	5.5	1.061 Oblong	Russet	3.0
Krantz (CO)	275.0	71.9	9.9	5.7	1.060 Oblong	Russet	3.3
TXA 867-1	273.3	57.6	10.0	4.2	1.065 Oblong	Russet	2.7
MN 12331	264.0	40.9	0.0	3.6	1.061 Oblong	Russet	3.0
AC 77226-13	255.6	70.4	10.5	5.6	1.065 Oblong	Russet	2.3
ND 1520-3 Ru	255.6	42.7	10.2	4.4	1.062 Oblong	Russet	2.7
ND 2141-4 Ru	228.0	50.1	9.2	4.2	1.057 Long	Russet	2.5
Krantz (ND)	218.4	69.5	11.3	5.5	1.064 Oblong	Russet	3.3
ND 2207-8 Ru	180.3	28.7	14.4	3.9	1.057 Long	Russet	2.0
ND 1850-5 Ru	166.1	49.5	10.5	3.9	1.053 Long	Russet	2.3
ND 1538-1 Ru	144.6	60.8	10.0	5.0	1.053 Long	Russet	2.7
Average	287.6	61.9	10.9	5.1	1.061		3.0
LSD (.05)	72.3	7.9	2.4	0.2			

1/ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, percent by weight over 4 ounces, average tuber weight of 10 ounces plus grade, average weight per tuber in ounces, specific gravity, tuber type, skin type and general rating of 38 Red and White potato varieties or selections grown at Springlake, Texas - 1987.

Variety or Selection	Total Yield CWT/A.	% By Wt. over 4 oz.	Average Tuber Wt. of 10 Oz. + Grade	Average Weight/ Tuber in oz.	Specific Tuber Gravity Type	Skin Type	General Rating 1/
Red LaSoda	486.1	77.3	11.9	5.7	1.060 Oblong	Red	3.7
A 7914-3	477.1	70.5	10.4	4.7	1.061 Long	White	3.0
Mn 12567	438.2	58.8	10.4	4.9	1.066 Oblong	White	3.0
Red LaSoda (NEB)	419.0	62.6	11.9	4.8	1.061 Oblong	Red	2.7
Mn 13415	399.0	24.2	0.0	3.0	1.060 Oblong	White	2.0
Red LaSoda #10	376.4	49.4	10.7	4.1	1.060 Oblong	Red	2.7
Sangre	375.5	49.6	13.3	4.1	1.062 Oblong	Red	2.3
AC 80545-1	369.7	87.2	11.8	8.0	1.066 Oblong	White	3.7
Sangre #10	365.3	68.8	11.9	5.2	1.057 Oblong	Red	3.3
Sangre #14	362.4	62.5	13.5	4.6	1.058 Oblong	Red	3.0
LA 0138	355.4	80.4	11.9	6.6	1.063 Oblong	White	3.7
Mn 13056	337.2	59.7	10.9	4.5	1.056 Oblong	White	3.0
New Superior	323.5	69.3	11.2	5.1	1.069 Oblong	White	2.7
NDTX 9-1068-11R (ND)	322.3	74.5	11.9	5.2	1.062 Oblong	Red	5.0
New Norchip	317.4	50.2	10.7	4.0	1.067 Oblong	White	2.3
Red LaSoda #5	316.2	57.6	11.3	4.7	1.062 Oblong	Red	2.7
Mn 12823	308.1	69.7	11.4	4.5	1.064 Oblong	White	3.3
Mn 13395	307.5	71.6	11.0	5.9	1.060 Oblong	Red	3.0
BN 9803-1	307.0	42.0	9.0	3.9	1.063 Round	White	2.0
Mn 13035	300.6	33.3	0.0	3.5	1.052 Oblong	Red	2.0
NDTX 9-1068-11R (CO)	289.2	76.0	13.3	5.7	1.055 Oblong	Red	4.3
Denali #19	286.3	52.2	10.1	3.9	1.077 Oblong	White	2.0
Sangre #11	277.9	57.7	11.7	4.7	1.057 Oblong	Red	2.3

Continued

Texas Table 2. Continued.

Variety or Selection	Total Yield CWT/A.	% By Wt. over 4 oz.	Average Tuber Wt. of 10 Oz. + Grade	Average Weight/ Tuber in oz.	Specific Tuber Gravity	Skin Type	General Rating 1/
Mn 12820	275.3	29.4	3.2	3.3	1.061 Oblong	White	2.0
Mn 13054	265.7	51.8	10.7	4.0	1.060 Oblong	White	3.0
Mn 13294	255.3	21.8	0.0	3.4	1.083 Oblong	White	2.0
Mn 11705	243.6	26.8	12.8	2.9	1.063 Round	White	3.7
Red Sport Viking	234.4	67.7	11.4	5.0	1.061 Oblong	Red	3.0
Mn 12966	232.6	65.5	10.1	4.9	1.062 Oblong	Red	2.0
Mn 12945	226.2	32.6	0.0	3.4	1.056 Oblong	Red	2.0
ND 2050-1 R	223.9	51.3	9.4	3.9	1.058 Oblong	Red	2.0
Viking	220.7	80.7	10.5	5.7	1.062 Oblong	Red	2.7
ND 2224-5 R	217.5	20.3	0.0	3.2	1.057 Round	Red	2.7
ND 2008-2	213.7	39.8	12.8	3.7	1.058 Oblong	White	2.0
Mn 12828	203.0	41.2	0.0	3.6	1.066 Oblong	White	2.0
Mn 13332	197.8	43.6	0.0	3.7	1.063 Oblong	White	1.3
BC 0038-1	126.9	20.0	0.0	2.9	1.071 Oblong	White	2.0
Mn 13420	115.6	63.8	7.9	3.8	1.060 Long	Red	1.0
Average	299.2	54.2	11.0	4.4	1.062		2.7
LSD (.05)	57.5	9.7	1.4	1.0			

1/ 1 = very poor to 5 = excellent



Texas Table 3. Total yield, percent by weight over 4 ounces, average tuber weight of 10 ounces plus grade, average weight per tuber in ounces, specific gravity, tuber type, skin type and general rating of 6 Norgold Russet strains, as well as Norgold Russet, grown at Springlake, Texas - 1987.

Variety or Selection	Total Yield CWT/A.	% By Wt. over 4 oz.	Average Tuber Wt. of 10 Oz. + Grade	Average Weight/ Tuber in oz.	Specific Tuber Gravity Type	Skin Type	General Rating 1/
Norgold #35	409.5	68.7	10.0	4.7	1.060 Oblong	Russet	3.0
Norgold #40	398.7	73.8	13.2	5.1	1.066 Oblong	Russet	2.3
Norgold #19	384.2	74.7	12.2	5.4	1.054 Oblong	Russet	3.3
Norgold "M"	332.5	66.4	11.3	4.7	1.064 Oblong	Russet	3.7
Norgold #11	325.5	75.5	11.8	5.4	1.065 Oblong	Russet	4.0
Norgold Russet	313.3	59.9	13.4	4.0	1.062 Oblong	Russet	3.0
Norgold #12	260.8	70.3	12.2	5.5	1.061 Long	Russet	3.0
Average	346.4	69.9	12.0	5.0	1.062		3.2
LSD (.05)	119.2	12.5	3.3	1.4			

1/ 1 = very poor to 5 = excellent



Texas Table 4. Total yield, percent by weight over 4 ounces, average tuber weight of 10 ounces plus grade, average weight per tuber in ounces, specific gravity, tuber type, skin type and general rating of 13 potato varieties or selections grown in a strip trial at Olton, Texas - 1987.

Variety or Selection	Total Yield CWT/A.	% By Wt. over 4 oz.	Average		Specific Gravity	Tuber Type	Skin Type	General Rating 1/
			Tuber Wt. of 10 Oz. + Grade	Average Weight/ Tuber in oz.				
A 74212-1	392.5	54.9	9.8	3.6	1.075	Long	Russet	2.0
Norgold #40	304.0	46.6	10.4	4.4	1.065	Long	Russet	4.0
Russet Nugget	299.5	24.7	0.0	2.9	1.078	Long	Russet	3.0
Red LaSoda	286.2	29.5	0.0	4.1	1.064	Oblong	Red	3.0
Sangre	281.0	40.1	9.1	3.2	1.064	Oblong	Red	3.0
Norgold "M"	280.7	37.8	14.0	3.5	1.063	Long	Russet	4.0
NDTX 9-1068-11 R	266.4	51.0	12.0	4.3	1.064	Oblong	Russet	4.0
New Superior	266.2	47.7	10.1	3.6	1.077	Oblong	White	4.0
Denali #19	259.2	48.4	10.4	3.3	1.080	Oblong	White	2.0
Krantz	245.9	58.1	10.0	4.6	1.065	Oblong	Russet	3.0
Viking	238.1	53.9	9.6	4.0	1.062	Oblong	Red	2.0
Russet Norkotah	191.0	41.5	12.8	3.2	1.062	Long	Russet	2.5
HiLite	136.6	22.9	12.8	2.2	1.061	Oblong	Russet	2.0
Average	265.2	42.9	11.0	3.6	1.068			3.0
LSD (.05)	42.3	12.2	2.8	0.3				

1/ 1 = very poor to 5 = excellent

## VIRGINIA

S. B. Sterrett, C. P. Savage, Jr., and W. R. Groton, Jr.

- Objective:** Replicated yield trials included a total of 53 round white and 18 russet cultivars or advanced numbered clones. The observational trials included an additional 17 entries. Evaluations included yield, size distribution, vine and tuber characteristics, and susceptibility to internal and external defects. Chipping quality of selected round white entries was also determined.
- Method:** Trials were planted on March 25, 1987. The experimental design was a randomized complete block with four replications. Single row plots were 25 ft in length with 36 inch between-row and 12 inch within-row spacing. A total of 150 lbs N, 100 lbs  $P_2O_5$ , and 100 lbs  $K_2O$  were applied in bands on a State sandy loam soil. Linuron (0.44 lbs ai/A) was applied preemergence on April 21, 1988. A total of 1.75 inches of irrigation was applied in June.
- Russets were hand sized by weight. Specific gravity was determined by weight-in-air, weight-in-water method. Ratings for internal defects were made on 20 tubers in the 2-1/2 to 3-1/4 inch (12-16 oz) size range. Marketable yield is based on tubers greater than 1-7/8 inches (round white) or 4 oz (Russets).
- Seasonal Observations:** Cool temperatures and wet soils in March delayed planting, thereby shortening the growing season to 103 days. Foliar symptoms of air pollution injury were minimal. As with commercial fields in this area, both excessive skinning and strong attachment of tubers to the vines were noted at harvest. Plots were gleaned after being mechanically harvested and the glean weight recorded before grading. Percent glean yield reflects the percentage of total yield that would be lost during harvest. Heat necrosis was more severe than in 1986, both in terms of number of tubers affected and in severity (rating). Heat sprouts, sunburn, and second growth accounted for most external defects; few growth cracks were observed.
- Promising Clones:** Several round white selections show potential for both fresh market and chip stock, combining high yield, specific gravity, attractive tuber confirmation, and acceptable chip color. These include B9955-46, B0209-1, and B0257-9. Susceptibility to internal heat necrosis may be a problem with B0257-9. The selection B9792-157 also has potential for chips, but is slightly more irregular, with deeper colored eyes. While B9792-157 is less susceptible to internal heat necrosis than Atlantic, the specific

gravity of B9792-157 is also lower than Atlantic. High yields and acceptable tuber confirmation for fresh market were noted for both B0203-21 and NY 81. However, their mid-to-late season maturity may limit demand on the Eastern Shore where earliness is needed to satisfy the fresh market window. Marketable yield of the russet selections B0045-6 and B0220-14 was more than double the yield of the standard, BelRus. However, inadequate yield in the count box sizes (greater than 8 oz) remains a persistent problem.

**Acknowledgements:**

We gratefully acknowledge the assistance of Steve Molnar, Wise Foods, Inc., Benwick, PA, and David Dickerson, Anheuser-Busch Co., Inc., St. Louis, MO with chip color evaluations. Seed was provided by Raymon E. Webb, USDA-Beltsville, Robert L. Plaisted, Cornell University, and Alvin F. Reeves, University of Maine.

Virginia Table 1. Yield and size distribution of advanced round white clones - 1987.

Clone	1/ Clone	Total Yield cwt/A	Marketable Yield		%	% of Total Yield			Specific Gravity	Days after Harvest		Chip Color	
			cwt/A	% of Standard		1	2	3		1	3	1	3
Atlantic		239	178	114	6	24	25	45	1.068	2	5	2	5
Delta Gold		69	20	13	51	62	12	14	1.056	2	-	2	-
Desiree		71	13	8	35	80	14	4	1.054	-	-	-	-
LaChipper		265	193	124	3	27	24	44	1.059	4	5	4	7
Pungo		167	86	55	8	29	25	25	1.060	5	8	5	8
R Pontiac		224	78	50	24	46	23	11	1.043	-	-	-	-
Superior (Std)		214	156	100	0	23	25	46	1.064	3	5	3	7
Yukon Gold		262	186	119	14	26	24	45	1.063	-	-	-	-
AF1101-7		223	100	64	26	35	15	28	1.055	6	8	6	8
B9955-46		233	186	119	3	19	20	53	1.068	2	4	2	7
B0032-17		156	84	54	0	46	31	23	1.065	3	6	3	7
B0183-25		232	78	50	22	40	21	13	1.054	5	7	5	8
B0191-5		197	121	78	14	34	28	32	1.064	8	9	8	9
B0203-21		269	213	137	1	20	22	50	1.061	4	6	4	7
B0209-1		239	222	142	6	7	11	58	1.068	2	3	2	5
B0214-9		211	167	107	0	21	25	51	1.058	2	3	2	7
B0257-9		252	203	130	0	19	23	54	1.065	3	3	3	6
B0257-12		257	155	99	1	40	31	29	1.066	5	7	5	8
CS78162-12		161	83	53	1	47	34	18	1.059	3	4	3	6
F70021		214	140	90	1	33	26	36	1.059	6	8	6	9

1/ Planted March 25, harvested 103 days after planting.

2/ Size distribution: 1 = 1-1/2" to 1-7/8", 2 = > 1-7/8" to 2-1/2", 3 = > 2-1/2" to 3-1/4", 4 = > 3-1/4".

3/ Unreplicated samples, 1-4 = acceptable, 5 = marginal, 6 or above = unacceptable.

Virginia Table 2. Yield and size distribution of clone with chip potential - 1987.

1 / Clone	Total Yield cwt/A	Marketable Yield			%	2 / % of Total Yield			Specific Gravity	3 / Chip Color					
		cwt/A	% of Standard			GLEAN	1	2		3	4	Days after Harvest	1	3	7
Atlantic (Std)	243	191	100	5	21	19	53	7	1.065	2	4	7			
Norchip	228	120	63	13	35	23	29	0	1.063	2	3	5			
Superior	230	179	94	0	16	21	52	5	1.060	3	5	6			
AF875-9	226	146	76	3	34	29	35	0	1.070	5	4	5			
AF875-15	267	177	93	3	32	31	35	0	1.067	4	4	6			
AF875-17	241	159	83	1	34	34	32	1	1.069	2	6	6			
AF879-21	217	133	70	0	37	37	25	0	1.067	1	3	4			
AF879-23	236	158	83	1	33	35	32	0	1.072	2	3	6			
AF1022-1	181	118	62	1	34	32	33	1	1.075	2	6	5			
B9792-157	284	229	120	6	19	18	55	8	1.060	2	8	6			
B9792-158	287	211	110	8	25	26	44	3	1.062	4	5	7			
B0180-24	276	136	71	9	42	21	28	0	1.066	3	4	7			
B0233-1	230	177	93	4	3	20	21	53	1.060	4	6	7			
B0243-10	184	125	65	18	30	26	40	3	1.057	5	6	6			
D195-11	203	140	73	0	30	25	40	3	1.060	2	3	5			
FL657	237	213	112	4	9	11	62	16	1.051	3	5	4			
LA01-38	256	220	115	7	13	18	63	4	1.059	2	5	7			
MS700-83	208	140	73	1	32	26	38	3	1.063	1	4	6			
MS704-10	190	88	46	9	51	24	21	1	1.070	6	7	8			
NC73C26-1	250	116	61	4	50	28	18	0	1.064	4	6	8			
NY71	204	140	73	10	30	36	31	1	1.057	3	4	6			
NY72	106	71	37	23	29	20	43	5	1.056	4	6	6			
NY81	242	203	106	3	15	20	55	9	1.057	3	7	7			

1/ Planted March 25, harvested 103 days after planting.

2/ Size distribution: 1 = 1-1/2" to 1-7/8", 2 = > 1-7/8" to 2-1/2", 3 = > 2-1/2" to 3-1/4", 4 = > 3-1/4".

3/ Unreplicated samples, 1-4 = acceptable, 5 = marginal, 6 or above = unacceptable.

Virginia Table 3. Yield and size distribution of observational round white clones - 1987.

Clone <sup>1/</sup>	Total Yield cwt/A	Marketable Yield		%	% of Total Yield <sup>2/</sup>			Specific Gravity	Chip Color <sup>3/</sup>	
		(cwt/A)	% of Standard	GLEAN	1	2	3		Days after Harvest	3
Atlantic	215	162	109	3	23	20	46	1.071	6	7
Superior (Std)	192	149	100	2	13	23	54	1.061	5	7
B9955-28	180	141	95	2	18	23	54	1.057	5	6
B0176-24	156	87	58	8	40	24	31	1.065	-	-
B0179-1	130	83	56	0	34	33	31	1.077	-	-
B0237-9	196	116	78	2	39	32	26	1.059	-	-
B0240-11	148	116	78	25	21	19	54	1.051	6	7
B0243-11	193	145	97	5	21	20	51	1.059	4	6
B0243-18	203	124	83	3	36	24	37	1.066	-	-

1/ Planted March 25, harvested 103 days after planting.

2/ Size distribution: 1 = 1-1/2" to 1-7/8", 2 = > 1-7/8" to 2-1/2", 3 = > 2-1/2" to 3-1/4", 4 = > 3-1/4".

3/ Unreplicated samples, 1-4 = acceptable, 5 = marginal, 6 or above = unacceptable.



Virginia Table 4. Yield and size distribution of russet clones - 1987.

Clone	Total Yield cwt/A	Marketable Yield <sup>1/</sup> % of		%	% of Total Yield				Specific Gravity	
		cwt/A	Standard		GLEAN	1 2 3 4				
						Advanced Trial				
BelRus (Std)	179	85	100	2	41	46	1	0	1.064	
NemaRus	227	148	174	2	27	57	7	0	1.058	
Norgold R	206	76	89	3	48	36	0	0	1.052	
B9922-11	166	101	119	6	33	51	1	0	1.061	
B0045-6	294	184	216	1	36	55	7	0	1.065	
B0180-18	237	81	95	1	30	32	2	0	1.053	
B0180-31	214	68	80	5	42	31	0	0	1.058	
B0180-39	245	90	106	2	26	33	3	0	1.053	
B0189-45	256	149	175	4	36	48	10	1	1.058	
B0220-14	235	182	214	2	17	66	11	1	1.063	
Observational Trial										
BelRus (Std)	132	52	100	1	49	39	0	0	1.067	
R Burbank	80	0	0	46	28	0	0	0	1.051	
B0042-7	92	7	13	1	90	8	0	0	1.057	
B0186-1	196	96	185	4	23	39	9	2	1.059	
B0189-12	126	85	163	5	24	62	5	0	1.057	
B0190-13	186	90	173	1	44	43	5	0	1.070	
B0312-10	131	42	81	3	67	32	0	0	1.066	
B0328-12	95	5	10	2	85	5	0	0	1.074	

<sup>1/</sup> Size distribution: 1 = tubers < 4 oz., 2 = 4-8 oz., 3 = 8-12 oz., and 4 = 12-16 oz.

Virginia Table 5. Tuber characteristics and defects - 1987.

Clone	Tuber Rating <sup>1/</sup>				Defects <sup>2/</sup>				
	Shape	Size	Appear.	Skin Mat.	Sprouts	Sun burn	2nd Gr.	Heat #	Nec. Rate
Chip Trial									
Atlantic	2	7	7	6	9	9	9	4	6
Norchip	3	4	5	6	9	9	3	1	8
Superior	4	6	7	7	9	9	5	0	9
AF875-9	3	5	6	7	9	9	8	0	9
AF875-15	3	6	5	5	9	9	7	1	4
AF875-17	2	4	6	6	9	9	9	0	9
AF879-21	4	4	5	7	9	9	8	0	9
AF879-23	3	5	6	6	9	9	9	0	9
AF1022-1	2	4	5	6	9	9	9	0	9
B9792-157	2	7	6	7	9	8	8	1	8
B9792-158	2	6	6	6	9	9	9	0	9
B0180-24	2	5	5	6	9	9	7	3	6
B0233-1	4	6	5	5	9	9	9	5	5
B0243-10	3	4	5	5	9	9	9	11	5
D195-11	3	6	7	5	9	9	9	4	6
FL657	2	8	5	5	9	9	9	1	7
LA01-38	4	7	6	5	9	9	9	0	9
MS700-83	3	5	5	7	9	9	9	0	9
MS704-10	2	4	6	6	9	9	9	0	9
NC73C26-1	3	4	6	7	9	9	9	0	9
NY71	2	5	7	6	9	9	9	0	9
NY72	3	5	5	5	9	9	7	0	9
NY81	2	7	7	6	9	9	9	1	4
Advanced Round White									
Atlantic	2	6	7	6	9	9	9	13	6
Delta Gold	2	1	2	4	6	9	2	0	9
Desiree	3	1	2	7	6	9	5	0	9
LaChipper	3	6	6	6	9	9	9	0	9
Pungo	3	5	5	6	2	9	3	0	9
R Pontiac	2	5	6	5	9	9	5	0	9
Superior	4	5	6	7	9	9	5	0	9
Yukon Gold	3	6	6	4	6	7	6	7	7
AF1101-7	2	4	2	7	2	9	3	0	9
B9955-46	3	6	6	6	6	7	6	1	8
B0032-17	2	5	7	8	9	9	9	0	9
B0183-25	3	5	6	5	9	8	2	2	8
B0191-5	3	5	5	5	9	9	5	0	9
B0203-21	3	6	6	6	9	9	9	1	8
B0209-1	3	8	7	5	9	9	9	1	8
B0214-9	2	4	6	6	9	9	9	0	9
B0257-9	3	5	7	6	9	8	9	2	8
B0257-12	3	4	7	6	9	9	9	0	9
CS78162-12	2	4	6	7	9	9	8	0	9
F70021	2	5	6	6	7	7	7	3	6

Virginia Table 5. Continued.

Clone	Tuber Rating <sup>1/</sup>				Skin Mat.	Sprouts	Defects <sup>2/</sup>			
	Shape	Size	Appear.	Sun burn			2nd Gr.	Heat #	Nec. Rate	
Observational Round White										
Atlantic	2	7	7	6	9	9	7	4	7	
Superior	4	6	6	7	9	9	5	0	9	
B9955-28	2	7	7	6	9	5	6	0	9	
B0176-24	2	5	7	5	9	9	8	6	5	
B0179-1	2	4	6	5	9	9	9	0	9	
B0237-9	3	5	6	7	9	9	6	0	9	
B0240-11	2	6	7	6	9	9	9	3	7	
B0243-11	3	6	7	7	9	8	7	3	5	
B0243-18	3	5	6	5	9	9	9	2	8	
Advanced Russet										
BelRus	7	5	5	5	9	6	8	2	6	
NemaRus	6	6	6	6	8	7	7	1	8	
Norgold R	5	5	5	6	9	9	8	0	9	
B9922-11	7	6	5	5	9	9	7	1	8	
B0045-6	7	6	7	5	7	8	7	0	9	
B0180-18	6	6	4	6	9	9	4	0	9	
B0180-31	7	6	4	5	9	9	4	1	8	
B0180-39	7	5	3	4	9	9	5	2	5	
B0189-45	7	7	7	7	7	9	7	0	9	
B0220-14	7	7	6	5	8	8	9	0	9	
Observational Russet										
BelRus	7	4	5	4	9	9	8	4	8	
R Burbank	5	2	2	4	4	9	1	0	9	
B0042-7	5	3	3	8	9	9	9	1	7	
B0186-1	7	7	6	6	9	9	4	0	9	
B0189-12	6	4	6	5	9	9	7	0	9	
B0190-13	7	5	6	6	9	9	8	3	6	
B0312-10	6	3	5	6	9	9	9	0	9	
B0328-12	5	2	3	6	9	9	6	0	9	

<sup>1/</sup> Shape: 1 = round, 5 = oblong, 9 = very long (cylindrical). Size: 1 = very small, 9 = very large. Appearance: 1 = very poor, 9 = excellent. Skin maturity: 1 = totally peeled during harvest and grading, 9 = skin intact.

<sup>2/</sup> Defects: 1 = severe, 9 = none. Ratings of heat necrosis made on 20 tubers in the size range 1-1/2" to 3-1/4".

## WISCONSIN

R.E. Hanneman, Jr.

Enhanced Production  
of Botanical Seed  
via Supplemental  
Macronutrient  
Fertilizer  
Applications

Genetics and Cytogenetics of the Tuber-bearing *Solanum* Species (Cooperative USDA, ARS and Wisconsin Agricultural Experiment Station)

The Inter-Regional Potato Introduction Project (IR-1) is charged with the maintenance of the United States potato germplasm collection. Fulfillment of this responsibility includes performing yearly seed increases to replenish accessions depleted by distribution, declining germination, etc. This experiment was undertaken to determine the usefulness of supplemental macronutrient fertilizer treatments for enhancing seed production resulting from such increases.

Twenty plants of each of 130 accessions were grown in 15 cm clay pots in the greenhouse in a sterilized medium consisting of 1/3 organic soil : 2/3 top soil. One-half teaspoon of the slow release fertilizer "Osmocote" (19-6-12) per pot was mixed into the medium. One-half of the plants were also treated with a supplemental liquid fertilizer by applying one cup of "Rapid-Gro" (23-19-17) at the recommended one tablespoon per gallon concentration. One application was made at about one month after potting and a second application was made about three weeks later.

Most plants treated with supplemental fertilizer were notably larger, greener, produced more flowers and senesced later than the untreated plants of the same accession. Treated plants produced an average of 867 additional seeds per plant pollinated ( $\pm 290$  at 99 percent confidence), an average increase of over 80 percent. The average number of seeds per fruit was unchanged.

It is concluded that application of supplemental macronutrient fertilizer promotes a significant increase in seed production per plant compared to plants treated with slow release fertilizer alone.

Crossability of  
1EBN Wild Potato  
Species with Group  
Tuberosum Haploids

Several diploid, wild species categorized as 1EBN have many desirable characteristics which would be useful in a potato breeding program. Unfortunately, interspecific crosses between these 1EBN species and cultivated *S. tuberosum* have been largely unsuccessful.

Utilizing the Endosperm Balance Number (EBN) hypothesis, a crossing scheme involving female Group Tuberosum haploids x 1EBN 2n pollen producers and colchine-doubled 1EBN clones was initiated. The purpose being to synthesize sexual hybrids which would allow for genetic exchange between the genomes of

*S. tuberosum* and the 1EBN species. Subsequently, the hybrids could then be utilized as a vehicle for the eventual transfer of desirable traits to the tetraploid cultivated potato.

During the winter of 1987, species categorized as being 1EBN types were screened for 2n pollen. The species were *S. bulbocastanum* (blb), *S. brevidens* (brd), *S. brachistotrichum* (bst), *S. chancayense* (chn), *S. commersonii* (cmm), *S. cardiophyllum* (cph), *S. etuberosum* (etb), *S. fernandezianum* (frn), *S. jamesii* (jam), *S. mochicense* (mcc), *S. pinnatisectum* (pnt), and *S. trifidum* (trf). Pollen diameters varied between and within species, but in general 2n pollen was in the range of 1.20-1.32X the diameter of 1n pollen. Several 2n pollen producers were identified within the species screened, but only those clones with greater than three percent 2n pollen were actually utilized in crosses.

Preliminary crosses were performed under greenhouse conditions in the spring of 1987. Pollinations were randomly performed upon pot-grown plants of eight different haploid clones of Group Tuberosum. In the majority of cases, pollen no more than a week old was used. The results of these crossings were not encouraging but at that time it was thought that the few seed expected per pollination were not a strong enough stimulus in relation to the sink effect of developing tubers. The consequence of this sink competition was thought to be reflected in the poor fruit retention observed.

A larger-scale crossing program was undertaken in the summer of 1987. Six thousand and seventy-two pollinations were randomly performed utilizing fifteen different Group Tuberosum haploids as females. The cut-stem technique was utilized in all crosses. Fruit retention, as is generally the case with the cut-stem technique, was good. Parthenocarpic fruit were expected, but seed extraction during the fall revealed that the majority of fruit were parthenocarpic. Two Chippewa-derived haploids used as females also appeared predisposed to parthenocarpy, with the majority of fruit being derived from these two clones.

Currently, thirteen tbr-cmm hybrids have been obtained as well as nine tbr-chn hybrids. Eight of the nine tbr-chn hybrids have been verified as being triploid, which was the ploidy level predicted by the EBN theory. Unfortunately, these eight hybrids have poor male fertility. Doubling of these clones is currently being undertaken through the use of colchicine-axillary bud treatment as well as by rachis and petiole culture. Verification of the ploidy level of the tbr-cmm hybrids is currently being conducted.



The poor seed set obtained from the crossings was puzzling. The majority of seed that was obtained (90%) was from the use of chn 2n pollen producers as well as a colchicine-doubled cmn clone. Many male parents from other species had higher amounts of 2n pollen production or were also colchicine-doubled clones, yet no seed at all was obtained. Future research will involve stylar-pollen tube growth analyses from among the crosses conducted this past year. Such a study will be done to ascertain whether interspecific incompatibility may be another barrier to the successful utilization of these 1EBN species.

#### Estimation of Genetic Parameters in Autotetraploids

The schemes proposed by G.C.C. Tai for the estimation of genetic parameters in autotetraploids require the production of tetraploid progenies with a known genotypic frequency. The means generated from these families can then be used in a weighted least square procedure for estimating genetic parameters according to the additive-dominant model of Mather and Jinks (1982) and Killick (1971).

Several models have been proposed by Tai, the last one is based on a mating scheme which involves only  $2x \times 2x$  crosses. That scheme requires homozygous diploid parents producing 2n eggs and 2n pollen.

The scheme that is going to be used in the present research is a modification of those already proposed by Tai and involves  $4x \times 4x$  and  $4x \times 2x$  crosses. The still unclarified genetic mechanism of 2n egg production is excluded from the scheme.

The six means produced by the mating scheme and the means of the three tetraploid progenitors can be evaluated in an experiment to estimate seven parameters  $m$ ,  $d$ ,  $h_3$ ,  $h_2$ ,  $h_1$ ,  $\alpha$ , and  $\beta$ , with two degrees of freedom. There is also the possibility of including in the scheme the backcrosses  $AA \times Aa$  and  $aa \times Aa$  as families in another four matings.

With the formulation of this scheme the project has gone through the following steps:

1.-Parent Selection. The screen for 2n pollen and 2n egg producers was made among the selfed clones and families of *S. chacoense*. At least one 2n pollen grain was present in almost all the plants analyzed and the presence of large pollen was always accompanied by a reduction in the percentage of viable pollen, especially in the  $S_5$  generation of selfing. Generations of selfing of  $S_5$  to  $S_7$  differed considerably in this characteristic. The correlation between pollen size and presence of 2n male gametes as deduced by the microscopic observation and the obtainment of seeds from  $4x \times 2x$  crosses was not complete. The presence of four micropores was a general and exclusive characteristic of the large pollen. The small pollen usually had three and sometimes two micropores. Nine parents were selected based on the presence of large pollen and on seed production in  $4x \times 2x$  crosses.



2.-F<sub>1</sub> Production. Nine selected parents were intercrossed to produce the F<sub>1</sub>s or Aa genotypes. Some were unable to produce seed when used as females especially between the group of the S<sub>5</sub> selfing generation. A total of 33 families were produced. All the F<sub>1</sub>'s within the S<sub>5</sub> generation, except one, exhibited a complete restoration of fertility or an increase in the percentage of viable pollen, and in general large pollen was eliminated.

3.-Production of Homozygous Tetraploid Parents. The duplex, quadruplex and nulliplex genotypes are being produced using colchicine treatment on the AA, aa and Aa diploid parents. 116 new plants were recovered from the first five selected parents. The selection of doubled plant is being conducted by counting the number of chromosomes in buds (L2) and the number of chloroplasts in epidermal tissue (L1). There have been identified doubled plants for two progenitors. The colchicine treatment that is producing the largest number of doubled tissues is 0.25 g/l, applied for 24 hours on plants grafted on tomato. In general there are variable characteristics being expressed in the plants generated.

4.-Production of First Backcross. Fifteen F<sub>1</sub>'s (Aa) are being crossed with the parents AA or aa. At the present, fruits from almost all the crosses are developing.









